

Technical University of Denmark



## Can blind and visually impaired people evacuate safely in case of fire?

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## **Can blind and visually impaired people evacuate safely in case of fire?**

Members of the vulnerable part of the population such as people with disabilities are more likely to suffer during emergencies compared to able-bodied individuals. This makes it of high concern to place a focus on the fire safety provided in buildings and other structures for this segment of the population. Furthermore, the increased attention on accessibility to buildings has implied that all segments of the population might be present in the newer building stock. Hence, the vulnerable segment needs to be considered in calculations of occupant flow in both normal and emergency conditions while designing a building. However, the large group of people with impairments is still poorly described in the literature. The vulnerable segment of the population constitutes both children, and elderly and people with different impairment. In the current study the main target is the population of blind and visually impaired persons. During the past four years several evacuation experiments with this specific population have been carried out in Denmark and the United States with the Technical University of Denmark as organizer. The experiments have involved more than 60 people with different degrees of visual impairment. All experiments have been carried out in natural environments that blind or people with low vision are known to frequent. The experiments have focused on increasing the knowledge on different evacuation characteristics, e.g. walking speed horizontally and descending stairs, flow through doors, human behavior and interaction with the building environment. It is found that the unimpeded free horizontal walking speed in generally is lower comparing to able-bodied adults. Regarding walking speed descending stairs there is no significant difference between the values found in the performed experiments and the values prescribed for able-bodied in different national and international guidelines.

Another interesting issue about evacuation of people with impairments is that in Denmark this segment of the population is categorized as having a need for assistance during an emergency. Thus, they have to wait to be rescued by the fire fighters or other rescue personnel. Interviewing the participants involved in the experiments has revealed that these people do not acknowledge their status about the need for assistance. These people are used to do all kind of everyday life things such as using the public transportation to get from point A to point B, grocery shopping, manage a job etc. It is believed that these people will not wait to be rescued but will try to evacuate themselves, because they feel independent. Therefore it is very important to include this segment while performing calculations for the evacuation safety in a building.

### **CV**

Janne Gress Sørensen has a master's degree in Civil Engineering from the Technical University of Denmark from 2011. In her master thesis she performed several evacuation experiments with blind and visually impaired participants. The experiments were performed in collaboration with different Danish organizations for blind and visually impaired people. Since October 2011 she has worked on her PhD project entitled "Evacuation of people with visual impairments". The project is funded by the EU Program Interreg IV A Öresund. In the fall 2013 she had an external research stay for four months at National Fire Protection Association, Boston, MA, USA, where she performed a series of evacuation experiments with the US Access Board as collaborator. During the work with the PhD project Janne has attended several conferences about fire safety, human behavior and evacuation. Besides the PhD project she is engaged in international standardization work about design of evacuation experiments and how to describe occupant behavioral scenarios related to designing the evacuation safety for a building.