How to improve urban accessibility for the Deaf and Hard of hearing?
Subtitle
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**Introduction**

Among the sensory impairments, hearing impairment and the difficulties it causes are still poorly understood by decision-makers and designers, who therefore find it difficult to take them into account in designing the mobility chain.

**Background**

Hearing loss can be defined as a deterioration of the hearing system. It can occur at any age and have very different consequences depending on its causes, its severity (average level of loss), the age at which it occurs, etc. Hearing loss thus regroups together several different categories of populations that often have little contact with each other: the deaf and the hard of hearing, those born deaf and the late-deafened, Deaf (signed language only) and oral deaf, etc. The people in charge of accessibility must be aware of the particularities of this population in order to propose appropriate solutions.

We can especially distinguish between people, known as “hard of hearing”, who can still use some of their hearing abilities to communicate and understand their environment (mild to severe, or even very severe if fitted with a hearing aid) and those, said to be deaf, mainly not fitted with a hearing aid and who have to rely on other sensory channels (mainly visual and gestural).

According to a quantitative study on hearing loss, published in 2014 by DREES, people reporting at least one form of hearing loss (irrespective of degree) account for 11.2% of the French population (or about 7 million people). But if the analysis is extended to include people who say they are uncomfortable following a conversation with others, this same study points out that “functional hearing loss” more likely affects 16.1% of the population, or about 10 million people. Of these, only 360,000 are affected by very severe or total loss involving the complete (or almost complete) absence of perception and use of auditory information in their environment. On the other hand, over 9 million can be considered as hard of hearing.

**Method / Design**

Thanks to a literature review, the difficulties caused by hearing impairment were identified. They include the perception of sound messages related to unexpected events or alerts, communication and orientation, and the acoustic discomfort felt by people with hearing impairment in some confined spaces.

**Results**

The difficulties caused by hearing impairment were identified thanks to a literature review and highlighted in four types of difficulties for people who are deaf or hard of hearing can be highlighted:

* problems with the perception of audible messages giving warning, or about unexpected events;
* communication difficulties;
* orientation difficulties;
* acoustic discomfort felt by people with hearing loss in some enclosed spaces.

Solutions are available and can easily be applied. First of all, technical aids adapted to each context must be provided: those using sound, those using text or images, and those using other means. In public buildings and on public transport, staff must be specially trained, and particular attention must be paid to the acoustic and visual quality of indoor environments. Warning or access control devices must be adapted to transmit signals that everyone can perceive. Visual information must be developed in transport, buildings and public spaces. The latter must also be designed to be readable and to en-sure the safety of all users, particularly in areas that are used for a great variety of pur-poses.

**Conclusion**

In terms of accessibility of the travel chain and inclusion of all groups in society, it is es-sential to consider the needs of people with hearing loss, whether they are deaf or hard of hearing. This is because it is a disability that may go unnoticed but affects a large number of people, particularly due to the ageing of the population.

A better understanding of the needs of the people concerned, whether in buildings, pub-lic spaces or transport, is essential. It also turns out that these needs, which have to do with communicating with others and perceiving messages of all kinds, are ultimately simple to understand and satisfy.

While necessary for people who are deaf and hard of hearing, compliance with these recommendations is beneficial to everyone, especially the elderly, tourists, the absent-minded, people using their phones or listening to music, and those finding themselves in a noisy environment or in the vicinity of silent hazards caused by electric vehicles.

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