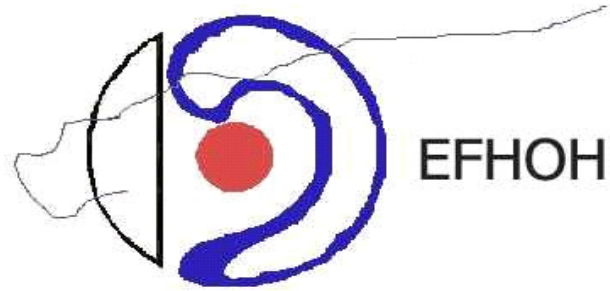**Creating a barrier-free Europe for all hard of hearing citizens**

EFHOH

European Federation of Hard of Hearing People

GUIDELINES

for

accessibility

Content

Introduction

This document is aimed at raising awareness about the profile, needs, abilities and preferences of hard of hearing individuals in the modern world. This must focus not just on identifying and lowering existing barriers, but equally so on preventing new barriers from being raised.

The UN Convention

The foundation of all this work is the **United Nation's Convention on the Rights of People with Disabilities**, in this document referred to as the **UN CRPD**. This convention now ratified by all major European states, covers all areas of the society, such as health care, education, accessilibity. There are 50 articles in this convention, the most important in the context of this document are:

Article 9   Accessibility;
Article 21 Freedom of expression and opinion, access to information;
Article 24 Education;
Article 27 Work and employment;
Article 29 Participation in political and public life;
Article 30 Participation in cultural life, recreation, leisure and sport.

The following points are the most important ones in a strategy to work towards the goals in the convention:

- Accessibility and inclusion should be a key part of all societal planning, design, implementation and deployment.

- "Venues and service points where sound is broadcast shall offer assistive listening, such as induction loop systems designed to the IEC 60118-4:2006 standard, that broadcast sound directly to hearing aids and cochlear implants, enabling them to serve as customized, wireless loudspeakers (without the need for extra equipment)."
  /Quoted from the Resolution adopted at the International Hearing Loops Conference in Winterthur, Switzerland in September 2009/
  This applies to theatres, cinemas, concert halls, meeting rooms in conference venues and in premises belonging to public authorities, political councils etc.

- All television programmes, films and video clips should be subtitled and equipment for both standard and high definition television should fully support closed subtitling. This should include all modes of broadcasting adn video delivery: Internet TV, video/films downloaded or streamed to your TV/DVD/videoplayer.

- All parts of the public transport systems, from information and ticket offices to information provision during and after travel should be made fully accessible through visual information, induction loops and staff training. This includes stations, terminals and airports. The services and duties of airlines and railway companies is subject to regulations issued by the EU, see annex.

- All hotels should have accessible rooms where communication and alerting facilities are suitable for hard of hearing people.
  All ships carrying passengers should have accessible cabins with appropriate communication and alerting sysmtems, and information displays inall communal passenger areas on board the ship.

- ToIP (Text over IP) real-time text and total conversation-real time text = video and voice simoultaneously: All telephone networks and services should support ToIP and real time text, to ensure maintaining connectivity to legacy analogue text-phones.

- Good acoustics is needed to enable och support speech communication. The requirement for good acoustics applies to all premises where people spend some time.

TO BE HARD OF HEARING – basic needs

"Hard of hearing people" is used as a definition to describe all groups of hard of hearing individuals, covering everybody with a hearing loss, ranging from light hearing loss to adult, profoundly deafened users. Unlike pre-lingual deaf people, hard of hearing people develop and use the spoken language (with or without supportive signs).

Light hearing loss

People with a light hearing loss can often manage without a hearing aid, but they are dependent on adhering to certain rules of communication. Good acoustics, no background noise, good lighting and clear articulation by the interlocutor are all factors that contribute to better comprehension for this group.

In the modern society, there is a lot of noise, and hard of hearing people encounter more problems in daily life than they did 100 years ago. Traffic noise, background music in shopping centres and from household machines are examples of noise nuisance that make the understanding of speech difficult.

This group benefits in a similar degree from visual information and subtitling as hard of hearing people with a more severe hearing loss do.

Many, within this group, have a progressing hearing loss, but taking the step to start using hearing aids is often a large barrier for many of them. The longer they wait, however, the more problems they get, and the result is often job loss, failure in education and social isolation.
Therefore it is important for professionals and organisations to give society information about hearing loss and the problems and solutions connected with it.

Moderate to severe hearing loss

The most important support for this group is a good hearing aid. A hearing aid can also be used together with other listening devices such as an induction loop or desktop loop.

A hearing aid must always be customised to the individual's level and profile of hearing loss, and the process of adjustment should be accompanied by training in how to use and how to maintain the hearing aid.
Other factors to take into consideration are the dexterity and mobility in fingers and hands as well as other health conditions. Older people very often have problems with hearing aids that are too small or too complicated.

In addition to their hearing aid, the same rules of communication as for those with a light hearing loss apply to this group, in particular the provision of visual information and subtitling.

Adult, profoundly deafened people

Adult deafened people we call those individuals who have lost almost all or nearly all hearing ability, but after they have developed spoken language.
Cochlear implants have proven to be a good solution for some, while others depend on micro-link or other listening devices connected to the hearing aid.
In many situations, the equipment does not provide a sufficient solution, and speech-to-text interpretation or use of supportive signs needed.

Speech-to-text interpretation must always be offered at no cost to hard of hearing people themselves and in all situations needed. Examples are: in education, in meetings, during visits to local and national government offices, for medical visits or to attend the police station, and indeed for all other situations where good communication is important.

At home or with friends, supportive signing can be very helpful. Supportive signs must not be mistaken for deaf sign language. Sign supported languages are spoken languages of the country with signage supporting comprehension.
There should be training courses for family and friends, free of charge, available.

Adult deafened people are totally dependent on visual information, subtitling and
in certain situations tactile devices.

List of measures to improve comprehension and communication

- clear speaking in moderate speed, the speakers face visible
- a well adjusted hearing aid, suitable for the person and his/hers hearing loss.
- good acoustics
- good lighting
- induction loops
- desktop loops
- equivalent visual information
- subtitling and captioning
- safety equipment with vibrating alarms and/or flashing (strobe) lights
- training courses for lip reading and sign support

Some of these measures are dealt with in separate sections below.

ASSISTIVE TECHNOLOGY

For most of hard of hearing people, the basic needs include a hearing aid. However, the hearing aid is not a sufficient measure to make the society accessible: To travel; to be able to participate in culture and in political councils; at school or at work. In all these situations hard of hearing people are dependent on various forms of assistive technology. This includes both acoustical as visual systems.

Induction loop and similar systems

A loop system helps hard of hearing people who use a hearing aid, loop listener and cochlear implants to hear sounds more clearly by reducing or cutting out background noise. At home, for example, you could use a loop to pick up sound from your television, hi-fi or radio. A loop can also be set up with a microphone to help hearing aid users hear conversations in noisy places. In the theatre, a loop can help you hear the show more clearly. A loop cannot be used to give stereo sound. If this is important, you should consider using an infrared system.

How induction loop systems work

An induction or hearing loop is a cable that circles the listening area. An electric current is fed to the loop by a loop amplifier. The amplifier gets its signal from a microphone placed in front of the person speaking or by means of a direct connection from another sound source, such as a sound system. The resulting electric current in the loop produces a magnetic field, which corresponds to the sound. You can then pick up this magnetic field if you are sitting within the area of the loop and your hearing aid - or loop listening aid - is switched to 'T'. You will need to adjust your own hearing aid for volume.

In addition to loops covering a room/church/assembly hall etc. loops can be used on counters and as a neck-loop. The latter is often used as a personal assistive device, which can be combined with other transmitting technologies like FM, Bluetooth.

Coverage and supply of sources

An important requirement for rooms other than cinemas is that the loop system should cover not only the area for the audience, but also the podium or any other area used by speakers/performers.

The usability of the loop system strongly depends on the source that feed the system.

There should be sufficient number of microphones to catch up the sound. Not only
the main speakers/lecturers, but also from speakers on the floor asking questions etc.

Desktop and counter loops

A desk loop is a small induction loop placed on or under the desk or at counter windows, covering a small area.

Desktop/counter loops are important for communication in ticket offices, at information desks, in hotels, banks, the post office, pharmacies and chemists, as well as other retailers, and make it possible for hard of hearing people to receive information privately and without misunderstandings.

This is of particular importance with regard to ticket offices and information desks at public transport terminals, where the acoustic environment often is very bad and affected by high levels of background noise and echo.

Infrared system

An infrared system is an alternative to a loop system. It consists of a transmitter and a listening receiver. Sound is fed to the transmitter in the same way as with the loop system, either by a direct electrical connection or via a microphone. It is then transmitted as invisible infrared light to where you are sitting.

How to use an infrared system

To hear sound, you need to use an infrared receiver:
- The under-chin 'stetoclip' type receiver is suitable for people who do not use a hearing aid. If you do use a hearing aid, you can still use this type of receiver, but you will need to remove your hearing aid first.
- A neck-loop receiver is used with a hearing aid. You need to set your hearing aid to 'T'. This type of receiver is suitable for people with a greater level of deafness or hearing loss.
- Infrared receivers are sometimes built into headphones, but make sure that you use ones designed for people who are hard of hearing.

All types of receiver are battery-operated and therefore give you complete freedom of movement. Infrared systems are less likely to have problems with interference or sound spilling over into other rooms. However, strong sunlight and dark wall coverings can reduce the quality of sound and area they can work in.

Several infrared systems can be used simultaneously in rooms next to each other and they are suitable for confidential meetings. They provide high quality sound. Stereo versions are available.

Note! For all types of assistive listening systems, it is fundamental to have someone who is responsible for the maintenance. All systems have to be tested every time before use, either by a hearing aid user or by other person equipped with a special testing device.

FM transmitter

A portable radio wave system with a microphone, transmitter and receiver can be used everywhere and gives people with a severe hearing loss the possibility to listen to guides in museums, speakers in rooms without induction loop, and by directing the microphone to people in a conversation it is easier to follow discussions and conversations.

A portable FM-system is a good solution in smaller meeting rooms, for 8-20 persons, where the hard of hearing attendants use a special receivers with either a neck-loop or headphones.

Speech amplifier

The expression "speech amplifiers" today represents a broad range of products using different technology transmitting sound. You have a device picking up sound, a combined microphone and transmitter, and the user/hard of hearing wears a receiver. The receiver is used together with earphones. Many of them are very helpful for older people who can not manage a hearing aid. It is easy to use and produces a very good amplification of the speech. It is also very easy to adjust, even with bad dexterity in hands and fingers. Most of these systems can also be used together with a hearing aid, in situations where the hearing aids microphone is too far away from the sound source. In that case, the receiver is used together with a neck-loop.

Alerting/Alarm systems

There are 3 different alerting methods for hard of hearing people:

- Acoustic (strengthened signal)
- Optic signal (flashing light or strobe)
- Tactile (vibrating alarm to wear or to put under a pillow)

In homes, offices and other environments where hard of hearing people might be present, such accessible alerting systems must be connected to the smoke alarms, other detector based alarms, to the telephony ringing system, to the door bell and to any other system that requires alerting.

There exist also alarm clocks that use visual and/or tactile alerting to wake hard of hearing people up in the morning.

Suitable alerting systems that meet the needs of hard of hearing people are very important where health and safety is a concern, for example to prevent hard of hearing people to be killed in hotel fires.

Telephones

Many hard of hearing people are still able to use voice telephones, but often only of the telephone provides suitable adjustment. Some of the important features for hard of hearing people using voice phones are:
- The ability to turn up the ring volume or change its pitch
- Extension bells that can alert you (if appropriate through extra loud ringing) in other rooms or when outside, in combination where required with visual and tactile alerters
- Built-in or external telephone amplifiers that makes incoming speech louder
- Captioned telephone services where incoming speech is also displayed as text on a screen
- Built-in inductive coupler to use with a hearing aid on the T-setting.
- Tone adjustment, allowing hard of hearing users to make the incoming audio clearer to them
- Phones with two handsets can be used when you want a lip speaker to listen in to the conversation and help interpret it

Mobile phones

Mobile phones are mostly used as voice phones, but all mobile phones and networks now also support the SMS, short text message service. This can be useful for hard of hearing people wanting to communicate in text. In some countries, SMS messages can be sent to landline phones as well.
Mobile phones are smaller and so do not always offer the same degree of adjustment and adaptability as landline phones do. However, some mobiles offer better tone and volume adjustment than others and have also vibrating alerting built-in.
Some mobile phones can cause considerable interference when used near a hearing aid. In that case, using a neck-loop can help. These keep the mobile phone further away from the hearing aid and so reduce the chances of interference. They work with almost any hearing aid that has a 'T' setting. Today there exist many devices that use the Bluetooth technology, by which the sound is transmitted wireless between the phone and a receiver, which is coupled to a neck-loop,
The result is the same as in the first case, but you do not need to have a wire connection to the phone, and thus offering the user a greater degree of freedom, putting the phone where you likes to have it.

Before purchasing a mobile phone, it is important to try it out in the shop and to make sure it has all the controls and adjustments needed and (if needed) that it works well with the users' hearing aid.

Internet Telephony/VoIP

More and more people are making and receiving calls over the Internet, using a technology called VoIP ('Voice over IP') or VoB ('Voice over broadband'). This can be done using either a software client on a computer, via a special VoIP telephone that connects directly to your broadband router/modem or plugs into a PC via a USB connector, or even via a normal telephone plugged into a special adapter.

Before subscribing to a VoIP/VoB package, users should try out the service and make sure it works well for them. Often, call quality can be as good or better than a normal landline or mobile, but not all software and hardware solutions provide full tone and volume adjustments, or suitable alerting tools. Also, with some VoIP services, it is not possible to make emergency (999/112) calls.
It should be noted that IP connections are not line powered via the exchange. In case of blackouts or other mains interruptions, no phone calls can be made. This can be a serious disadvantage for elderly persons using alarm systems operating via the telephone network.

Text telephony - real time text

Not all hard of hearing people are able to use voice telephony. In many countries, some form of text telephony is available. This refers to a technology where deaf, hard of hearing and speech impaired people are able to communicate through real-time character by character text (interactive text), In this document we call it *real time text,* which is promoted by a foundation called R3TF, Real Time Text Taskforce, www.realtimetext.org

Textphones and other real time text solutions allow people to send and receive text in real-time. Analogue textphones therefore have a keyboard and a display screen.
However, to communicate in text, both parties in the call must have a textphone device. In some countries, there exist therefore text relay services. When using a text relay service to call a hearing person, a relay operator will join the line. The text user can type or speak their conversation to the hearing person, the hearing person will speak their part of the conversation and the relay operator will type exactly what is being said.

Traditional textphones are landline, fixed network devices. However, mobile telephony has dramatically changed the way in which people communicate. The development in this field is amazing, and the phones are more and more becoming small, portable computers. Younger people today use their mobile phones for many things except voice calls.
It is important that many elder people who do not have a mobile phone or for other reasons, still like to use the text telephone.

Similarly, while Instant Messaging and chatting have become popular, mainstream text services used on the Internet, these services are not based on real-time text and often cannot be used to make text relay calls to voice phone users. Some solutions have been developed to bring real time text to mobile and Internet devices (such as TalkByText; AnnieS mobile text telephony on the Blackberry; ecPad, Allan eC etc).

> **Some projects and technical facts**
>
> EFHOH have been very active at the European and international level to promote a universal technical solution that ensures the use of real time text with no limitations. But the standardization work has so far been slow. One project is the Reach 112, where emergency centers will support real-time text audio and video.
>
> If successful, this would lead to interactive text/real time text becoming mainstream and a standard available communication service on mainstream telecom networks and terminals. Mobile and IP based networks should provide real-time text using the open industry standard for ToIP or the defined standards for real time text: IETF RFC4103 and ITU-T T.140. Backward support of legacy PSTN Text telephones must be provided at the borders of the network using gateways that translate the interactive ToIP text stream to the analog text protocols such as V.21, DTMF, EDT, Minitel and Baudot and vice versa.

SUBTITLING

Subtitling or captioning is a special way of text information. EFHOH regard this so important that we give it a special part with a separate headline.

Television is the most important media for sport, entertainment, information and politics. Hard of hearing people should not be excluded from using this most pervasive and often important information medium. The arguments about costs and lack of technical solutions for live subtitling are often incorrect and ultimately not relevant, as the cost of exclusion has time and again been proven to be much larger than the cost of providing access services.

The live subtitling systems available today are mainly human operator based, using either a standard keyboard or high-speed input methods such as velotype or palantype. Some solutions use automatic speech recognition to assist the operators in generating the output.

The subtitling can either be in open format, where it is part of the main vision picture, or in closed format, where users can switch it on or off according to their preference and need.

What is said about television is equally valid for film, DVD and all visual media formats.

Today an increasing amount of television broadcasts and films are also available via internet. Of course these shows should be subtitled as well.

SOUND ENVIRONMENT – other measures

Acoustics

The acoustic environment in buildings and other man-made surroundings very important. For hard of hearing people, the main consideration in terms of acoustic properties is to enable and support speech communication. This means that background noise is suppressed, while increasing the speech-intelligibility. Good acoustics also benefit microphone/loop systems and help people with milder hearing loss who don't use hearing aids or other technical devices. Background noise comes both from activities in the room (-s) as well as from the outside (such as traffic noise).

This requirement for good acoustic environment applies to all premises where people spend some time. Not only meeting rooms in offices, but equally so classrooms and lecture theatres in schools and the like, foyers and corridors; cafés and restaurants. Larger rooms like auditoriums for 100 people or more, should always be designed by an acoustic expert.

Special building materials and curtains can be used to reduce echo and make listening easier in meeting rooms. Equally important is the design of furniture and other interior fittings. For

example: The moving of chairs on a hard surface often causes very disturbing noise. Softer floor materials and/or "muffling paws" can reduce this noise.

Lighting

Good lighting makes it easier to lip read. It is therefore important that the speaker's face is properly and uniformly illuminated. The best position in a room is usually the one where the hard of hearing person has his back towards the window so that the light from the window falls on the speaker's face.
Also it is of great benefit if the lighting is adjustable so that the speaker's face can be illuminated during projector shows and presentations.

Visual information

Providing equivalent, visual information is of great importance in all cases where information is conveyed via a loudspeaker or public address system. The information can be provided on a monitor or another form of display or on an information board.
One especially important area for visual information is public transport. The needs of hard of hearing people in public transport are compiled in a separate section below.

PUBLIC TRANSPORT

Despite all personal equipment, if you for example are not able to go to your work, or to participate in a meeting, visit a health care unit because of inaccessible transport system; then you are not a citizen with equal rights.

Therefore, hard of hearing people need full access to the public transport system. This includes various kinds of metro transport facilities: Taxi, bus, tram, underground, all other kind of rail transport both local and intercity/continental lines; seaborne crafts like small local ferries, other commuter boat lines as well as large ships on international routes and finally air transport

All public transport systems create noise that make listening difficult. In a noisy train station or a bus terminal, or in an airport, it is very important that it is possible to be able to read the information given out over the speaker system. This visual information must be equivalent in terms of both content and timing. There might be delays or other changes to a service, and not being able to understand the information creates an uncertainty and confusion that prevents many hard of hearing people from travelling or causes serious problems with missed or wrongly boarded connections.
All trains, trams, busses and metros should have visual information displays providing up-to-date details about platform, line, next stop, delays and emergency situations.

Laws and regulations

As per October 2010 the European Parliament has passed two important regulations concerning travel by air and rail:

- The regulation (EC) No 1107/2006 on the rights of disabled persons and person with reduced mobility when travelling by air.
  Entry into force 26.07.2008

In short there is a legal obligation for air carriers to accept a reservation from a disabled person and to embark a disabled person.

The regulation also deals with the needs of assistance: By notification no later than 48h prior to departure, a disabled person has the right to receive assistance adapted to his/her specific needs. Moreover, a disabled person has the right to bring mobility equipment and assistive devices; to have his/her assistance dog in the cabin.

- The regulation (EC) No 1371/2007 on rail passengers' rights and obligations
  Entry into force 3.12.2010

The Regulation applies to international journeys undertaken within the EU; international journeys to or from a third country if the EU has concluded an agreement on rail transport with that country. It lays down provisions on minimum requirements for the information to be provided to passengers before, during and after their journey, contract conditions, the liability of railway companies in the event of an accident, delays and cancellation of services etc.

Railway companies must provide passengers with the following information:

- *pre-journey information* concerning time schedules, fares etc.

- *information during the journey:* on board services, next station, delays and connecting services; security and safety issues.

- information after the journey: procedures and places for lost luggage, submission of complaints.

The full text for both regulations can be found at the EU website http://europa.eu ("The Gateway to Europe", where you choose your language and then navigate further).

Guidelines for all kinds of public transport

The above mentioned EU regulations only establish a minimum standard for disabled persons travelling by air or rail. The following text constitutes the requirements to create a good level of accessibility for hard of hearing persons, independent of what kind of public transport you use.

- **Taxi**

General comment:
One great improvement in taxis would be a loop system or other listening device to enable communication with the driver (when riding in the rear seat)

Currently there are loop systems installed in newer taxis of London. A similar system is planned to be installed in the New York City cabs. The cost for the NYC cabs are estimated to be $300, or about €200, per vehicle. Of course a widely spread standardized solution might bring the cost down.

The alternative is some other kind of listening device connecting the driver with the passenger. Wireless or not, it would be easier to install in existing vehicles. On the other hand it demands distribution of additional equipment to the passengers.
Although these are rather small, it still requires storage in the car.

Another important aspect of accessibility about taxis does not concern with the vehicle itself, but the way you order the taxi. How to communicate with the telephone service, not only by

voice phones, but by text phones, SMS and other visual means. Consequently this might not be a primary concern of IRU, but has to be regarded setting up this part of the business.

<u>Guidelines</u>

- Clearly visible information about the tariffs, payment and other
important facts about the ride.

- Loop system (or other listening device) facilitating communication with the driver.
If some kind of monitor is providing information for the passenger while riding, the sound from the monitor should be available in the listening system.

- Visual ways of communication with the telephone service when ordering a taxi: Text-phone, e-mail, SMS etc.

- **Bus and coaches**; **railway and air**

<u>General Comment</u>
There is a small difference between buses = used for urban transport, and coaches = used for travelling a longer distance. In both cases you have to consider the "whole chain" in the transport: All journeys start with booking or buying your ticket. A voice phone should not be the only way to do this. Internet, computerized vending machines are solutions that make it possible for all hard of hearing and profoundly deaf people to use the traffic system.

In urban transport the most important need is visual information about the name of bus stops, destinations etc. Today you will find this information on board buses and underground cars in many large cities.

When travelling by coach, other needs appear and the situation becomes more like that on the railway or when going by air: A longer journey where you often get additional information about the destination and changes to other kind of transport; delays or other unexpected incidents. Like on board aircrafts and trains, many modern coaches have monitors used for information related to both traffic conditions/itinerary and security, as well as entertainment.

<u>Guidelines</u>

Public transportation - applicable to all kinds of transport: Trains, buses, aeroplanes, ferries etc. Accessible information is especially important when something unexpected happens and missed information can cause a security risk = delays, changes to the planned itinerary;

- *Ticket and information offices/counters should be equipped with a loop system or other listening device. When there is such equipment installed or provided, there should be clearly visibly signage of sufficient size.*

- *Text displays/TV monitors giving the same information visually as that given on the loud speaker system, or otherwise verbally to the passengers. This applies both at stations/ in terminal buildings and in the vehicles.*

- *Subtitled safety information. Often safety announcements are given as short film clips. All such films must be subtitled in the same language as the spoken message in order to be accessible to hard of hearing people. If the message is delivered in more than one language, like on international flights: (The airline's "home language" and English), the subtitling should be in both languages.*

-   *Visual/tactile alarms connected to fire/evacuation alarms at stations/in terminal buildings. A tactile alarm should on request be available to passengers travelling by boats going on overnight routes where it is possible to stay in your own cabin during the journey.*

-   *On coaches: In addition to the visual information regarding safety and traffic information, a loop system or corresponding technology would be of benefit to hearing aid user while watching entertainment/DVD:s etc.*

Contact information

The editing of this version was finished in November 2010.
Comments or suggestions for future changes in the guidelines
are welcome.

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