

The Guide to Effective Communication for People who are Deaf and Hard of Hearing

Hearing Loss Data

The number of Americans with any degree of hearing loss is 72.88 million, according to the National Institutes of Health (NIH). and 11,642,464 people have a serious hearing loss, according to the 2021 American Community Survey Data for the US Census Bureau (Census) (Appendix B: Table B-1). The Census's estimate of 11+ million people with a serious loss undercounts the population *dramatically* by using questions that require respondents to admit to having such a loss. Many people with hearing loss are in denial.

And the large number of people with mild to moderate hearing losses should not be dismissed as unimportant. They often have difficulty understanding in locations with background noise or during telephone conversations with unfamiliar people and fast talkers. See my [Census Comment](#).

Further, the data does not distinguish between people who are culturally deaf and people who are late-deafened or hard of hearing, which impacts the type of access used. According to data reported in 1974, approximately half a million people use ASL. No thorough survey has been done since 1974 despite advances in technology, such as cochlear implants, which have contributed to a significant decrease in the number of people who are functionally deaf.

Nevertheless, places of public accommodation often provide American Sign Language (ASL), incorrectly assuming that all people who are deaf and hard of hearing are proficient in ASL. The reality is that the vast majority are unable to use ASL. Although ASL is vital to those who use it and should be provided as an option. However, ASL does not meet the needs of most people who are deaf or hard of hearing.

Legal Landscape

[Disability issues remain](#) a persistent challenge in the United States due to a combination of [misperceptions](#), systemic barriers, historical neglect, and ongoing discrimination. Despite various legal frameworks and executive actions aimed at promoting equity and accessibility, significant gaps and inconsistencies continue to hinder progress.

US Executive Orders [13563](#) and [13985](#) emphasize the importance of considering diverse perspectives and lived experiences in policymaking to achieve fairness and effectiveness in governance, including those of people who are “historically underserved, marginalized, and adversely affected by persistent poverty and inequality.”

US Executive Order [14035](#): Diversity, Equity, Inclusion, and Accessibility (June 25, 2021) mandates “a commitment to ensuring that people with disabilities can *independently access* every outward-facing and internal activity or electronic space, and the pursuit of best practices such as universal design.” (Italics added for emphasis.) Induction loops enable people with telecoil-equipped hearing aids and cochlear implants to independently access sound without relying on someone to distribute and retrieve a receiver, as well as ensuring that the receiver battery is charged and the accompanying neck loop works.

The US Department of Health and Human Services' recent Final Rule (45 CFR Part 84 RIN 0945-AA15) (HHS) on nondiscrimination in federally assisted programs states, in the definitions section at § 84.10, that auxiliary aids and services include “‘other similar services and actions.’ *The current definition allows for additional auxiliary aids not contained in the preceding lists.* We will retain the proposed language, which aligns with the communication requirements of the regulations under title II of the ADA.” (Italics added for emphasis.) Yet only a minimal number of medical facilities contain assistive listening technology for people who are hard of hearing.

Misperceptions about People who are Deaf or Hard of Hearing

Despite Executive Orders promoting equity, there is a notable gap in hearing access. Part of the issue is the lack of representation of hard of hearing individuals who do not use American Sign Language (ASL) in

decision-making roles within federal agencies and places of public accommodation. It is disheartening that individuals who do not experience the challenges of hearing loss firsthand, or parents of children who are hard of hearing, are often not making crucial decisions impacting accessibility for millions of Americans.

Furthermore, misconceptions and discriminatory statements about hearing loss have contributed to a challenging environment. I have experienced remarks such as:

Misperception	Reality
"At least people [with disabilities] aren't getting shot."	Ranking or comparing disabilities with other challenges is inappropriate.
"Hearing loss is not a severe disability."	Ranking which disability is more "serious" is inappropriate.
"People with hearing loss don't need an assistive listening device in a quiet room."	An assistive listening device brings the sound directly to a person's hearing aid or cochlear implant so the person's hearing device regulates the volume. Lack of background sound doesn't negate the need for an assistive listening system/
"Can't people just use ASL?"	The vast majority of people with hearing loss do not understand ASL. People tend to lump all individuals who are deaf and hard of hearing together despite their different needs. The population covers a wide spectrum.

"Can't people just read text?"	Text can't convey facial expression, tone of voice, and other important aspects of communication.
"Don't hearing aids cure hearing loss?"	Hearing aids do not cure hearing loss; they primarily bring the sound closer to a person's eardrum and regulate the volume.
"Induction loops are too expensive."	Induction loops may cost less than wheelchair access, and the price varies depending on a loop's complexity. Many loops are simple installations.

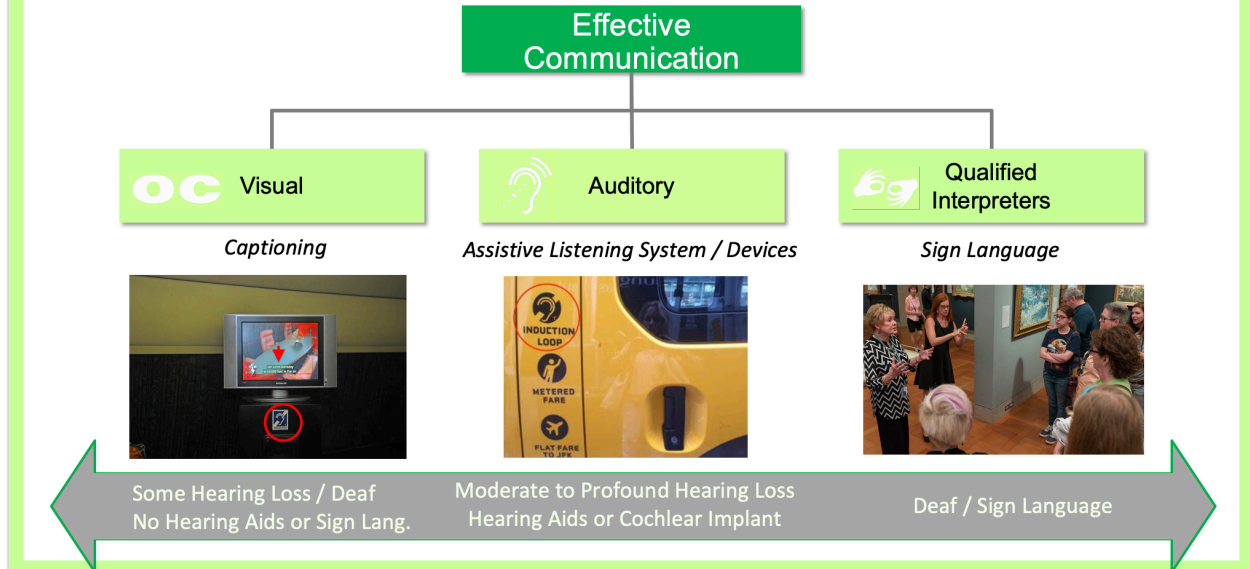
Effective Communication for People who are Deaf or Hard of Hearing

Hearing loss is a spectrum disability. The type of assistance required is dependent on a variety of factors, such as the person's degree of hearing loss, whether a hearing aid or cochlear implant is used, the age at which the person lost their hearing, the level of auditory training received, the person's current age, and the nature of the listening situation. See the chart below, which provides an overview of the type of assistance needed based on the degree of hearing loss. The assistance required is not as precise as the chart appears, since there is overlap between groups.

Three types of access should be offered whenever there is vocal output (live voice or recorded audio) in order to have full and consistent access for people who are deaf or hard of hearing:

- 1- Auditory - Assistive Listening System/Devices and
- 2- Visual - Captioning and
- 3- Qualified Interpreters

Three-Prong Approach to Effective Communication



Hearing Access Explained

A. Auditory: Assistive Listening System/Devices

In the US, the Americans with Disabilities Act of 1990 (ADA), updated by the 2010 ADA Standards, requires an assistive listening system (ALS) in spaces where communication is integral to the space and audio amplification is provided. The number of receivers required varies according to the number of seats.

1. Types of ALS (The Transmitter)

There are currently four types available:

- Induction loop uses an electromagnetic signal.
- FM works via a radio frequency.
- Infrared works via a beam of invisible light.
- Wi-Fi delivers audio over a local area network (LAN) to smart devices via *venue-provided* receivers.

All systems other than the induction loop require the use of a receiver to transmit the sound at the desired volume directly from the source to the

user's ear to eliminate the negative effects of distance, noise, and reverberation on sound clarity and for a person to disclose their disability to obtain a receiver.

In contrast, an induction loop brings the sound electromagnetically to a person's hearing aid or cochlear implant when the person switches to the telecoil/t-coil setting. Only people without a telecoil need to use a receiver. An induction loop permits a person who is hard of hearing to access the sound *independently without disclosing their disability*, which is consistent with the above federal Executive Orders.

2. Benefits

Hearing a presentation provides benefits that captions can't. An ALS allows someone with residual hearing to receive the benefits of sound (loud, soft, angry, happy, sad, singing etc.).

There are several factors that determine which system is most effective for each site. Some of the considerations are privacy issues, portability, the size of the space, the environment, construction materials (for instance, metalwork can absorb or distort magnetic fields), the impact of installing the system in the space, and cost.

- Induction Loops

Induction loops are the desired assistive listening technology [globally](#). (Please scroll down within the link.) An induction loop system utilizes an electromagnetic coil to create a magnetic field. Hearing aids or cochlear implants with telecoils receive the sound signal directly via their telecoil. The induction loop maximizes the customized output of the person's own hearing aid or cochlear implant.

Phones, audio guides, and sound enhancement devices that are telecoil compatible have a transmitting inductive coupler within the device. However, they work with only one ear, and people who are hard of hearing may need to receive sound in both ears to hear effectively.

An induction loop is the only type of ALS currently available that does not require the use of a receiver when the person has a telecoil-equipped hearing aid or cochlear implant. As a result, there is no need for locating, checking out, wearing, and returning visible headsets or neck loops. Thus, loop systems, when installed, are more likely to be used. An induction loop is also the only system currently available in transitory settings such as mass transit when there is insufficient time to distribute and collect receivers.

Further, venues with induction loops do not need to distribute or maintain as many receivers, since these are only needed for people without a telecoil-equipped hearing aids or cochlear implants. Induction loops are usable in most spaces unless there is electromagnetic interference. However, a skilled installer can usually address that issue.

The construction materials used in a building impact whether an induction loop can be utilized and how it needs to be configured. This could affect whether the system can be used in post-construction settings. It is important that the system, when installed, meets the IEC60118-4 standards for field strength and frequency response. An induction loop is often placed in a simple perimeter configuration in small settings, but a more sophisticated arrangement may be required in larger settings.

- FM

An FM system is not suitable if there is the possibility of FM interference, e.g. on airplanes, or if there are privacy concerns, since the FM signal can be picked up outside the room. Most Broadway theaters do not use an FM system because someone could stand outside a theater and record the signal.

Guided tours use portable FM systems, which overcome poor acoustics that can challenge even people who do not have a hearing loss. Guided tours cannot use induction loops since they can't be carried.

An FM system is usable where an induction loop or infrared system cannot work due to electromagnetic interference or bright light, respectively. It

also works well as a backup system when the main system fails or in places that cannot have a system easily repaired, such as on cruise vessels.

- Infrared

An Infrared system works via a beam of invisible infrared light. This system affords privacy, since the receiver must be in the path of light to receive the signal, which is confined by the walls of the room or auditorium. Some theaters utilize this system; others choose induction loops when they renovate because theatergoers don't wish to disclose their disability to hear the sound nor wear a perceived stigmatizing device.

An infrared system does not work well in large stadium settings where the distance is too great to receive the signal or in daytime outdoor settings where the daylight interferes with the signal.

- Wi-Fi

This system streams audio over a local area network (LAN) to a receiver. Wi-Fi systems can also be set to work with a user's smartphone, but people cannot be required to bring a phone to receive ADA-mandated access.

3. Receivers

People who have telecoils in their hearing aid or cochlear implant can receive signals directly through their hearing aid/cochlear implant when an induction loop is used.

When an FM, infrared, or Wi-Fi system is used, a receiver is needed for all users. Those with telecoil-equipped hearing aids and cochlear implants also require a neck loop plugged into the receiver to convert the sound to an electromagnetic signal that can be picked up by the telecoil.

There are different styles of receiver access for assistive listening systems. Earbuds plugged into the output jack of the receiver (which is typically the size of a deck of cards) fit directly into the ear. A person wearing hearing aids cannot use earbuds, since the hearing aids would need to be

removed. Many people are also uncomfortable inserting something in their ear that has already been inserted in another person's ear even when cleaned, particularly post-Covid.

Headphones also plug into the receiver. These do not work for people who wear behind-the-ear (BTE) hearing aids, and the design of some headphones doesn't confine the sound to the listeners' ears, so other people nearby could be disturbed.

It is important to ensure that a sufficient number of receivers are available. In the US, the requirements are detailed at <https://www.ada.gov/law-and-regs/design-standards/2010-stds> under "219 Assistive Listening Systems."

4. Considerations

These are some considerations to keep in mind when installing and using an ALS:

- The entire space should receive the signal. It is important to check the signal at each seat, especially under overhangs. There should not be any dead spots.
- High-quality speaker microphones should be used to ensure the best possible sound quality.
- The distance between the microphone and the speaker should be minimal, in order to provide sufficient clarity.
- When speakers are not talking from a microphone-equipped podium, they should be provided with wearable microphones rather than with microphones placed on the stage or hanging from the ceiling. Stage or ceiling microphones are suitable as a backup, but not as a primary source of sound transmission.
- The equipment should be tested and maintained regularly. Rechargeable batteries should be charged daily.

5. Bluetooth

Further, companies like Apple use proprietary Bluetooth LE (low energy) technology, but it is currently proprietary. Changing phones or hearing aids may require replacing the other due to pairing issues. Telecoil technology is

consistent across devices and does not require changes or updates. Bluetooth technology isn't available in public places globally and isn't allowed in secure government areas like the State Department. Upon information and belief, *Federal laptops do not contain Bluetooth technology because of privacy concerns*. Telecoil technology does not have such restrictions. The US Supreme Court has an induction loop.

While there are potential future options like Auracast, which uses the Bluetooth standard, works with all devices, and doesn't reportedly consume significant battery life, no company currently supports this technology. It will take upwards of ten years for the switch to work, if it works. Consider how many people are still using gas cars despite electric car availability. However, Auracast is something to watch.

B. Visual

1. Benefits

An ALS should not be expected to benefit the full spectrum of people with hearing loss. Some people are unaware that they cannot hear well, are in denial about their hearing loss, or have a hearing loss that is too severe to enable them to benefit from an ALS. (See chart above.)

A visual component is also needed, but it is not substitute for the auditory part. Both are necessary, since people with residual hearing want to hear, and many just use captioning to fill in the words they miss. Reading does not have the same impact as hearing the spoken words; that is why silent movies no longer exist. In addition, captioning does not generally work for children below approximately nine years of age because most don't have sufficient reading skills.

2. Types Available

The type of visual offering to use depends on a variety of factors, such as whether the situation is transitory, whether the person needs to respond or to look at a particular place at a particular time, and whether the communication is brief.

a. Captioning

Captioning is similar to a court reporter's transcription of a witness' statement, except it incorporates additional details such as the identification of the person speaking, background sounds, and emotions. Captioning should have a high degree of accuracy, since poor quality captioning does not provide effective access. See <https://www.fcc.gov/document/fcc-acts-improve-accessibility-closed-captioning-settings> and https://janicelintz.com/wp-content/uploads/2015/03/ana_closedcaption_whitepaper-f.pdf for recommended captioning standards.

Captioning contracts should include standards and not be based on price alone.

Captioning provides access for people whose hearing loss is more severe and who cannot or will not use an ALS. It can be prepared ahead of use (such as for a movie) or provided live (such as for a lecture).

Live verbatim captioning is also known as Communication Access Realtime Translation (CART). The CART provider's captioning skills must be checked prior to hiring, and a backup provider should be available in case of illness or emergency. CART should be offered for specifically scheduled presentations or when requested. Automatic captioning has improved dramatically and is often used, since it is synchronized with no time lag.

There are two types of captioning, open and closed.

- Open Captioning (OC): Open captioning is always visible. The captions appear directly on a film, on a data strip below the film, on a screen adjacent to the lecture or a play, or on the scoreboard at a sporting event. It should not appear above a film or in an area adjacent to the event. Visitors are not required to self-identify to receive the assistance they require and staff time is also saved, since employees do not need to activate the captions.

OC should be offered for lectures and other spoken presentations.

- Closed Captioning (CC): Closed captioning needs to be activated. The captions are either seen on the screen when someone turns them on or seen by a user who borrows the venue's captioning glasses or a small captioning receiver that is placed in a seat's cupholder. Closed captioning is useful for television programming and video meetings.

b. Paper and pen

These should be available at all concession, information, and ticket desks for people to receive written answers. This method is not effective for more than brief comments but is an important backup.

c. Tablets with a transcription program

These should be used at all concession, information, and ticket desks.

d. Personal Digital Assistants (PDAs)

These are hand-held devices that can display text. A PDA is preferable to a transcript because information can easily be searched on a PDA and it is less bulky than a large transcript. PDAs are useful for communicating in one-to-one situations. They are not effective as communication aids when there is a corresponding visual component that requires a person to look at a specific place at a specific time, such as at a theater, on an amusement park ride, or while watching a video, since it is impossible to read the text and look at the location simultaneously. Drivers are not permitted to read PDAs while driving for this reason. In addition, a person may need glasses when reading a PDA but not for distance. Changing back and forth is awkward, disruptive, frustrating, and can cause eyestrain.

e. Transcripts

These are only effective when they are short, time is not of the essence, and the communication is only oral with no corresponding visual component (such as radio broadcasting or an audio recording) so the person is not required to look at a specific place at a specific time. Transcripts should be available in regular and large print.

Unlike with an iPad, a transcript's information cannot easily be searched, and the transcript can be cumbersome. Video meetings should have downloadable transcripts.

C. Qualified Interpreters

Qualified interpretation such as American Sign Language (ASL), oral interpreting, transliteration, or cued speech needs to be offered in the format that an individual requires to achieve effective communication. ASL is a visual language with its own syntax and grammar that is quite different from spoken/written English. The majority of people with hearing loss do not use any form of sign language. It should be included as a vital component of access, but it is not a universal solution.

Qualified sign interpretation should be offered for scheduled and/or announced events and/or upon request with reasonable advance notice. Other forms of interpretation should also be available upon request. All interpreters should be certified. The qualified interpreter should ensure that there is a backup interpreter in case of illness or emergency.

Video Relay Interpretation (VRI) is used for remote interpretation on a laptop, iPad, or screen. The camera lens and screen must be wide enough for a person to view the interpreting, and strong broadband is required. VRI can be used during video conferencing, meetings, or when there is insufficient time to locate an in-person interpreter or none are available.

Video Relay Service (VRS) is used during phone calls and is paid for by the federal government. VRS cannot substitute for VRI.

CONCLUSION

Hearing access is not a menu from which to pick and choose. The following three types should be offered whenever there is voice or audio, in order to provide access for the entire population of people who are deaf or hard of hearing: (See attached [worksheet](#) for assistance.)

- 1- Auditory - Assistive Listening System/Devices and
- 2- Visual - Captioning and
- 3 - Qualified Interpreters

		Hearing Access Situations		
Situation	Examples	Deaf	Hard of Hearing	Hard of Hearing
			Hearing Aid or Cochlear Implant Wearer with a Telecoil	Non-Hearing Aid or Cochlear Implant Wearer or Person without a Telecoil
Announcements	Airport (Baggage Claim, Checkin, Amusement Rides, Customer Service , Waiting Area) Buses, Bus Stations, Ferries, Gym Class, Outdoor Events, Taxis, Train Station, Waiting Areas	Message Board	Induction Loop	Message Board
Auditorium	Stadium, Theaters	American Sign Language (ASL)	Induction Loop	CART or Synchronized Auto Captions
Front Desk	Bank Teller, Cashier, Funeral Homes, Hospitals, Hotels, Libraries, Museums, Pharmacy, Police Stations, Stores, Supermarkets, Ticket Desks	Video Relay Interpretation (VRI)	Induction Loop	Tablet with Synchronized Auto Captions
Intercom (SSTM) with Two-Way Communication	Elevator, Gas Stations, Kiosks, Museum Exhibits,	Video*	Induction Loop	Video*
Rooms	Classrooms, Conference, Event Spaces, Meetings	American Sign Language (ASL)	Induction Loop	CART
Video	Airports, Museums,	Captions**	Induction Loop	Captions**

*Remote Video, VRI, VRS requires a strong broadband. The camera lens needs to be sufficiently wide to view the ASL. Videos should have auto caption and a keyboard.

**Captions should follow Federal Communications Commission Guidelines <https://www.fcc.gov/document/fcc-acts-improve-accessibility-closed-captioning-settings>, the Association of National Advertisers Recommendations https://janicelintz.com/wp-content/uploads/2015/03/ana_closedcaption_whitepaper-f.pdf and be synchronized.