“Beyond the Noise”
Sound Masking for Integrators

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Sound Masking:
A Great Opportunity for Integrators

Opportunity in United States

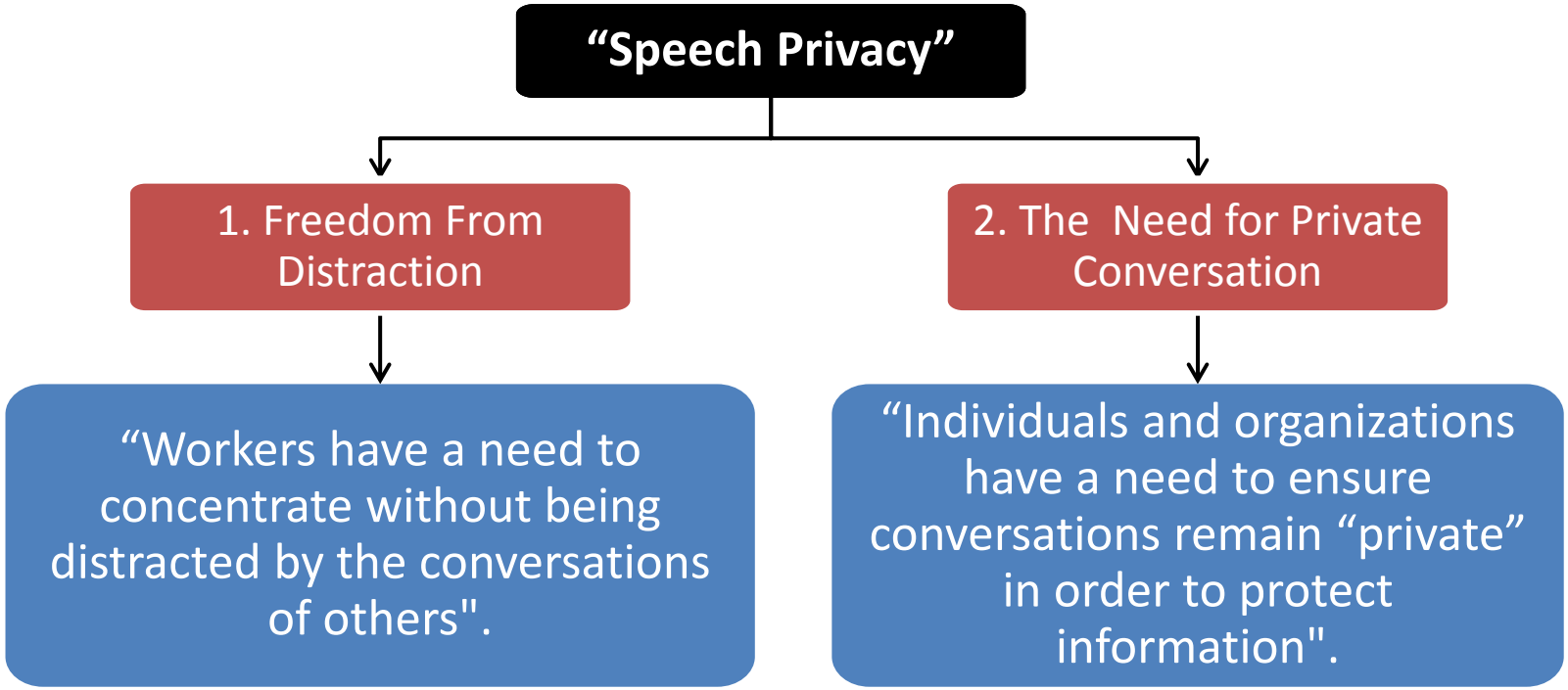
- According to the US Energy Administration in 2012, there was 87 billion square feet of “commercial building space” in the USA alone.
- “Commercial office space” made up 18% of that 87 billion for a total of 15.6 billion square feet.
- Annual growth of “commercial office space” is estimated at 1% increase in sqr ft. year over year.
- CSM estimates that approximately only 2% of the commercial office space in the United States has currently has some form of sound masking installed.
- Many of these clients already purchase other technologies from AV / ICT providers.

Definition of Speech Privacy

Speech Privacy…

"The inability of an unintentional listener to understand another persons conversation".

Speech Privacy Categories



Freedom From Distraction

Modern architecture trends in the workplace has lead to much distraction due to “open plan environments”, “benching”, “hoteling” and the need for “daylighting”.

“Workplace trends, while offering many benefits, can also often lead to distraction of the workforce through lack of speech privacy”.

Freedom From Distraction

The “loudness” of human speech has less to do with the amount of distraction, but rather it is the level of intelligibility in which that conversation is comprised that distracts.

“It is sometimes simpler to concentrate in noisy environments due to the fact speech is more difficult to clearly understand.”

“The human brain can more easily ‘tune out’ unintelligible conversations.”

The Effects of Poor Speech Privacy

Lost Time

Up to 21 Minutes Per Day

Lost Money

Approx. 80 Hours Lost Per Year per Worker

Unhappy Workers

Due to Lack of Concentration

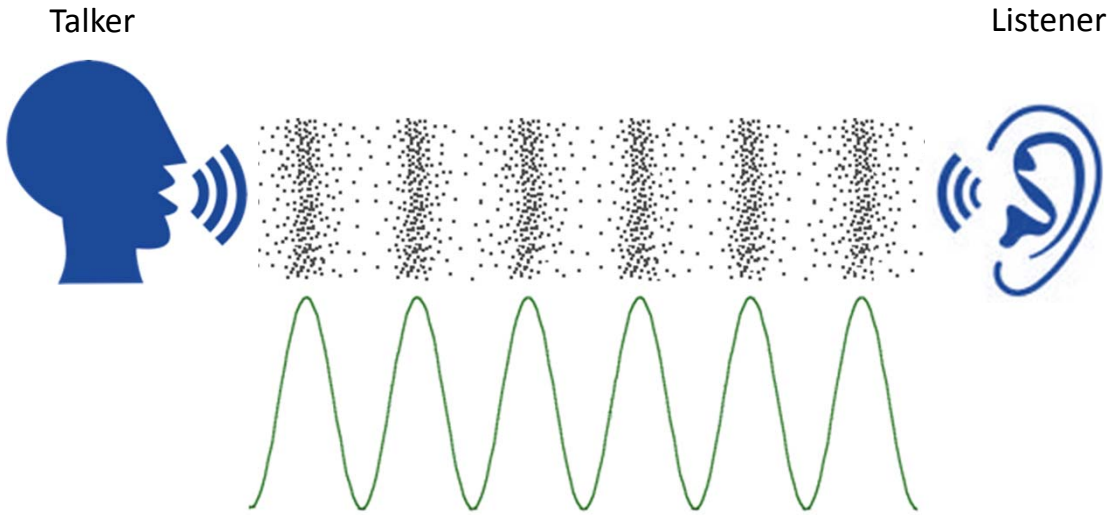
Private Conversations

In many cases conversations need to remain confidential to protect the private information of others. Such examples include "account information," "human resources," and "patient privacy."

"Private conversations between a doctor and patient can often be easily overheard in adjacent spaces due to lack of speech privacy".

The Acoustic Principles Behind Speech Privacy

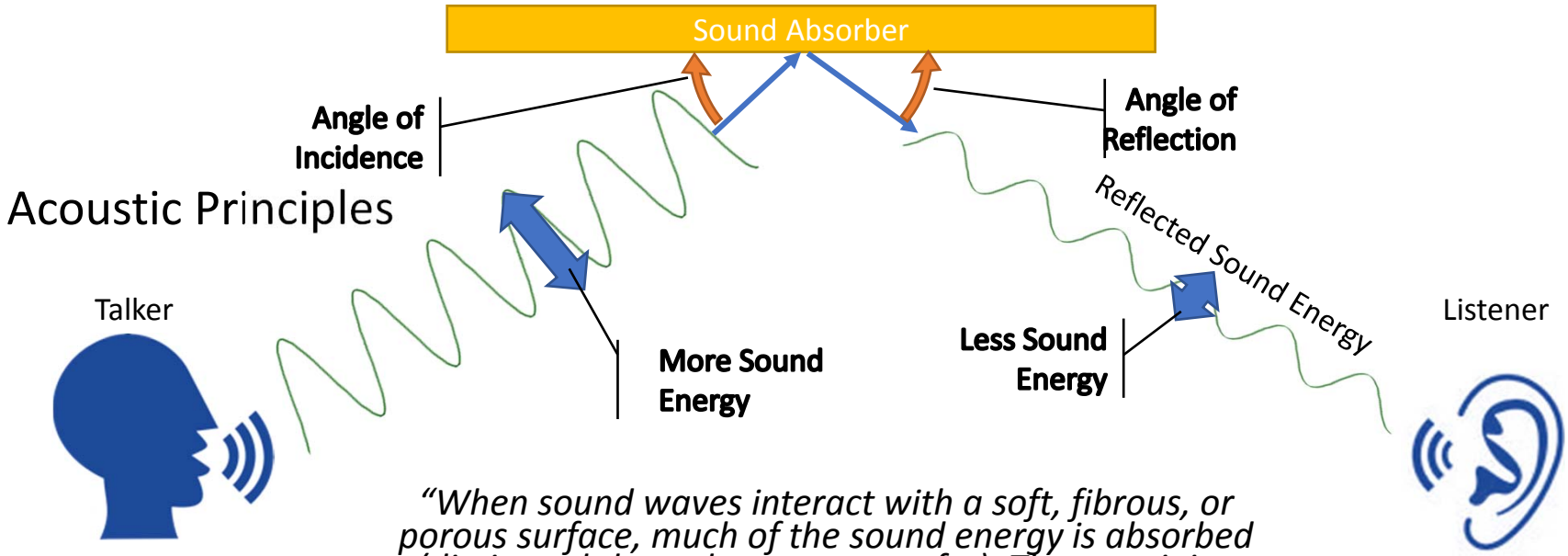
Sound Transmission in Materials



"The transmission of sound through air and other materials occurs through the vibration of molecules in a pattern called waves to transmit an audible signal".

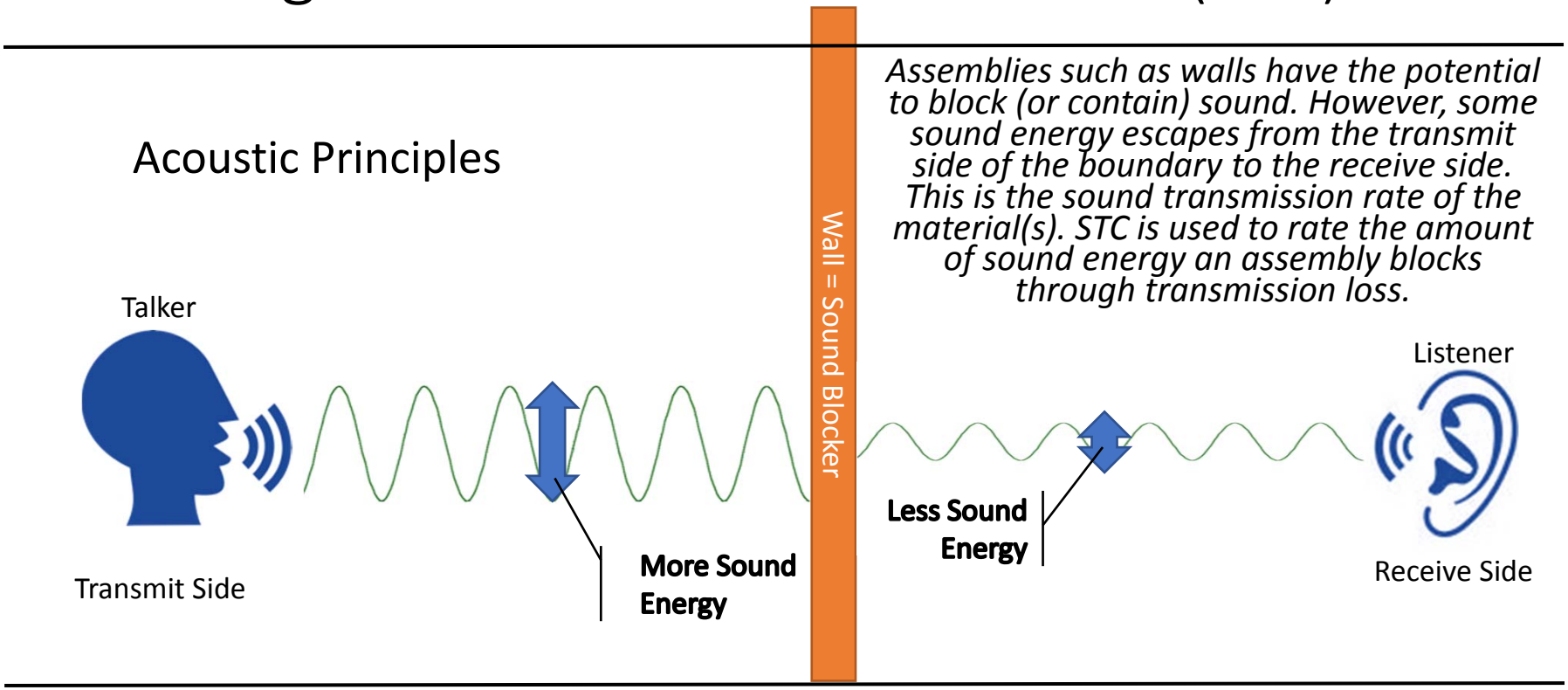
- The A,B,C,D's of Architectural Acoustics
  - Absorption
  - Blocking
  - Covering
  - Distance

Absorption = Noise Reduction Coefficient (NRC)



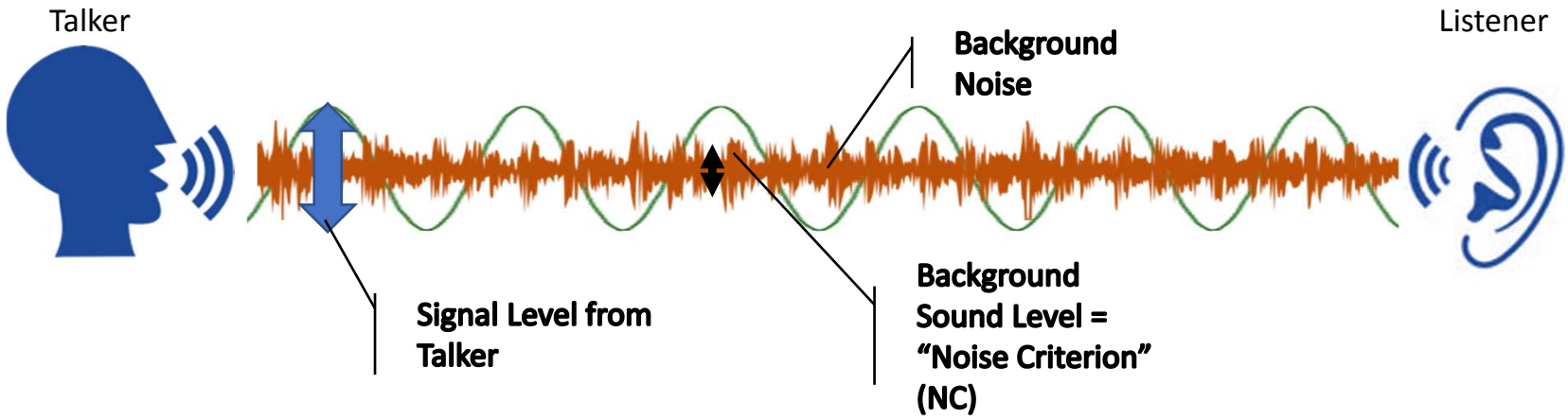
"When sound waves interact with a soft, fibrous, or porous surface, much of the sound energy is absorbed (dissipated through energy transfer). The remaining sound energy is reflected back to the listener."

Blocking = Sound Transmission Class (STC)



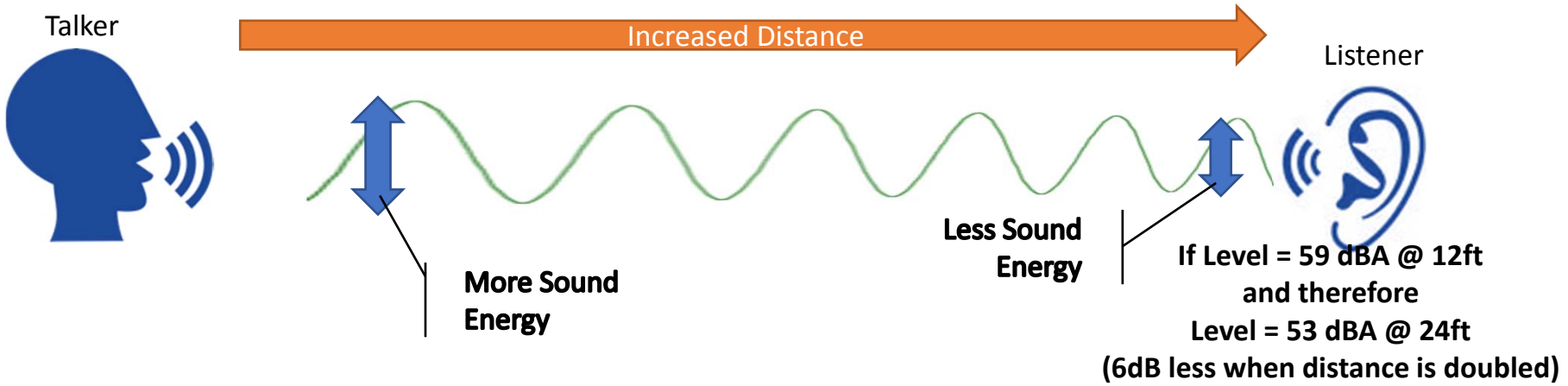
Covering = Noise Criterion (NC)

Sound waves can be covered up (masked) by other "noises" in an environment such as sounds generated by a sound masking system. The level of the background noise is often defined as the Noise Criterion Curve (NC) and can be described in lay terms as the "ambient sound level" found in a space. The higher in level the ambient, (NC), the more difficult speech intelligibility is to obtain in most circumstances.



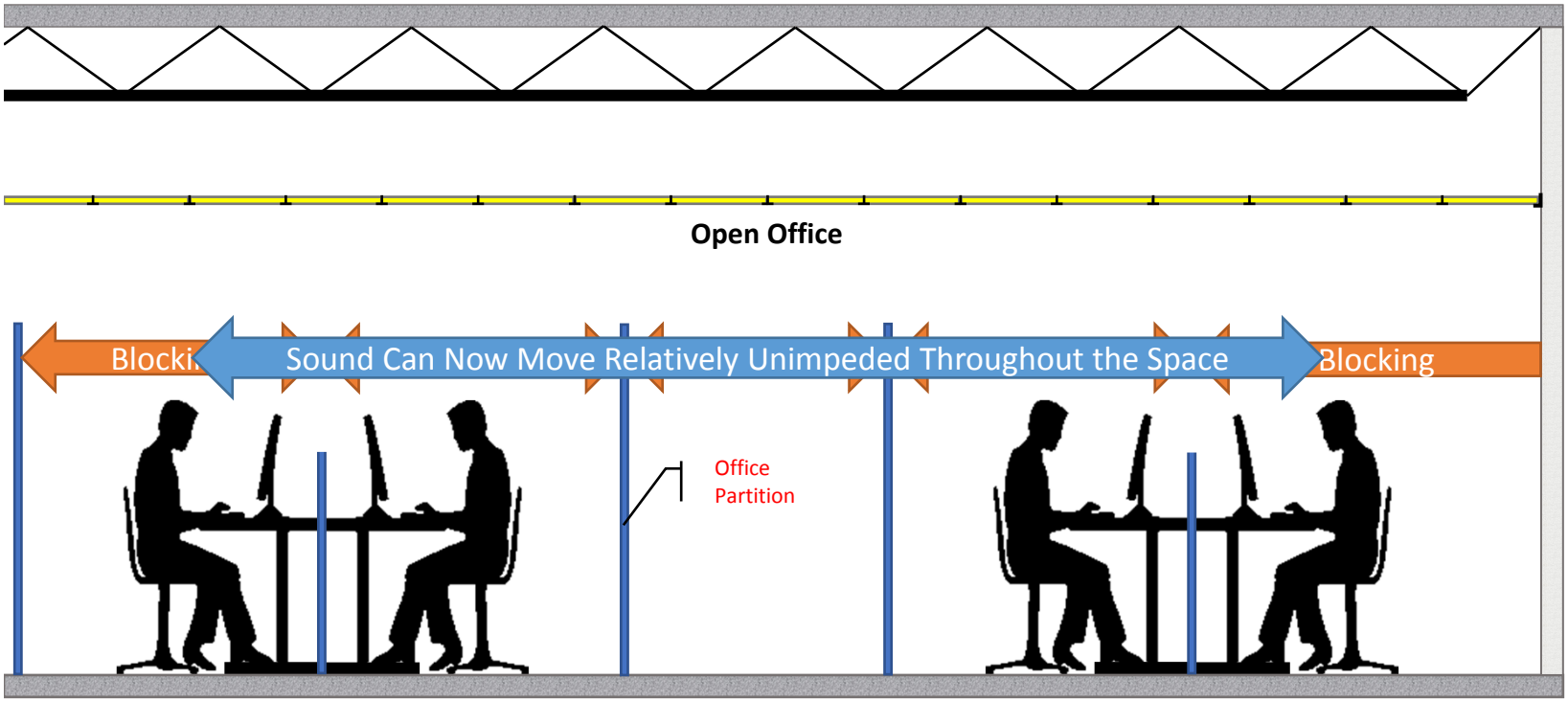
Distance = Inverse Square Law

"Sound waves decrease in energy (attenuate) due to distance. This rate of attenuation equals 6 decibels (6dB) per doubling of the distance from the talker to listener is known as "inverse square law". This explains why it is difficult to understand conversations from a great distance".

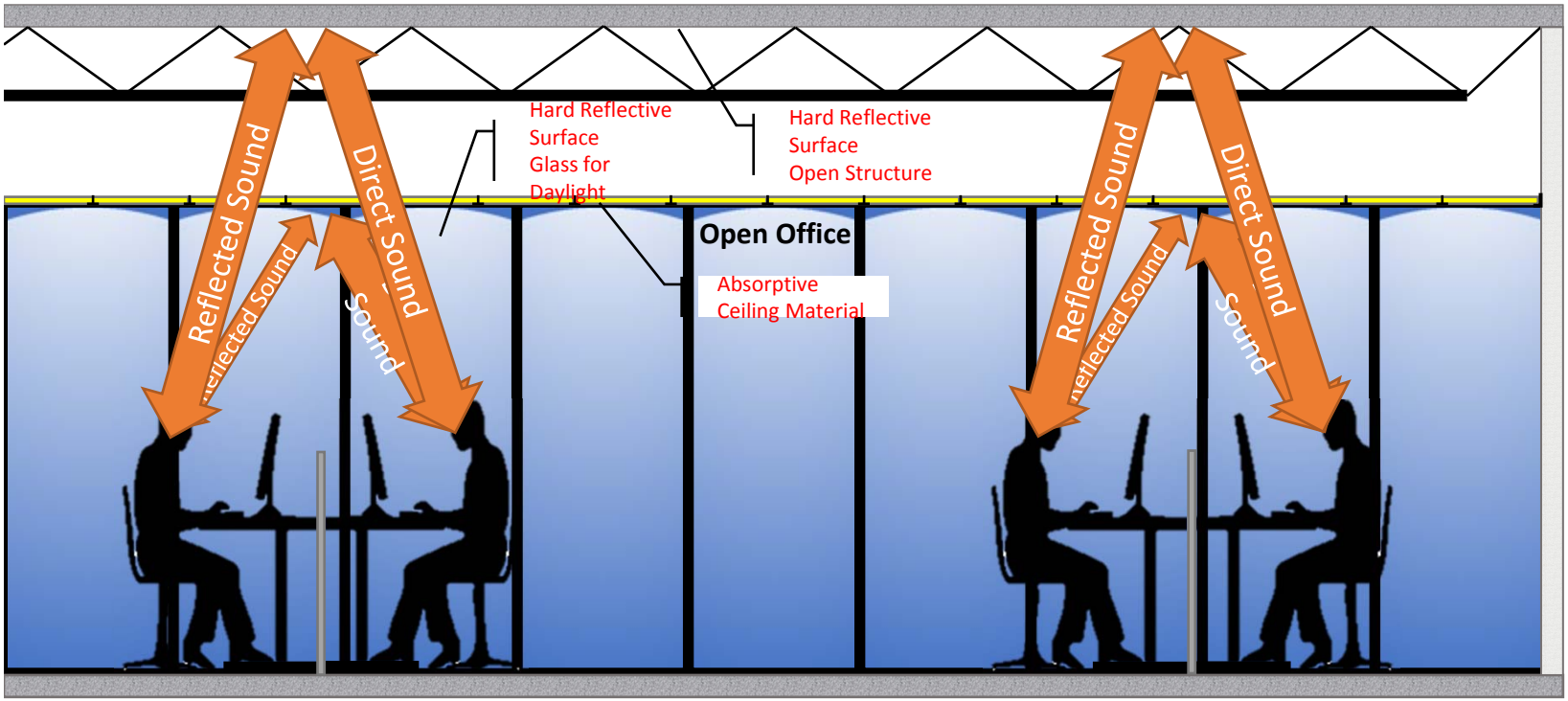


Why Modern Architecture is Driving the Need for Sound Masking Systems

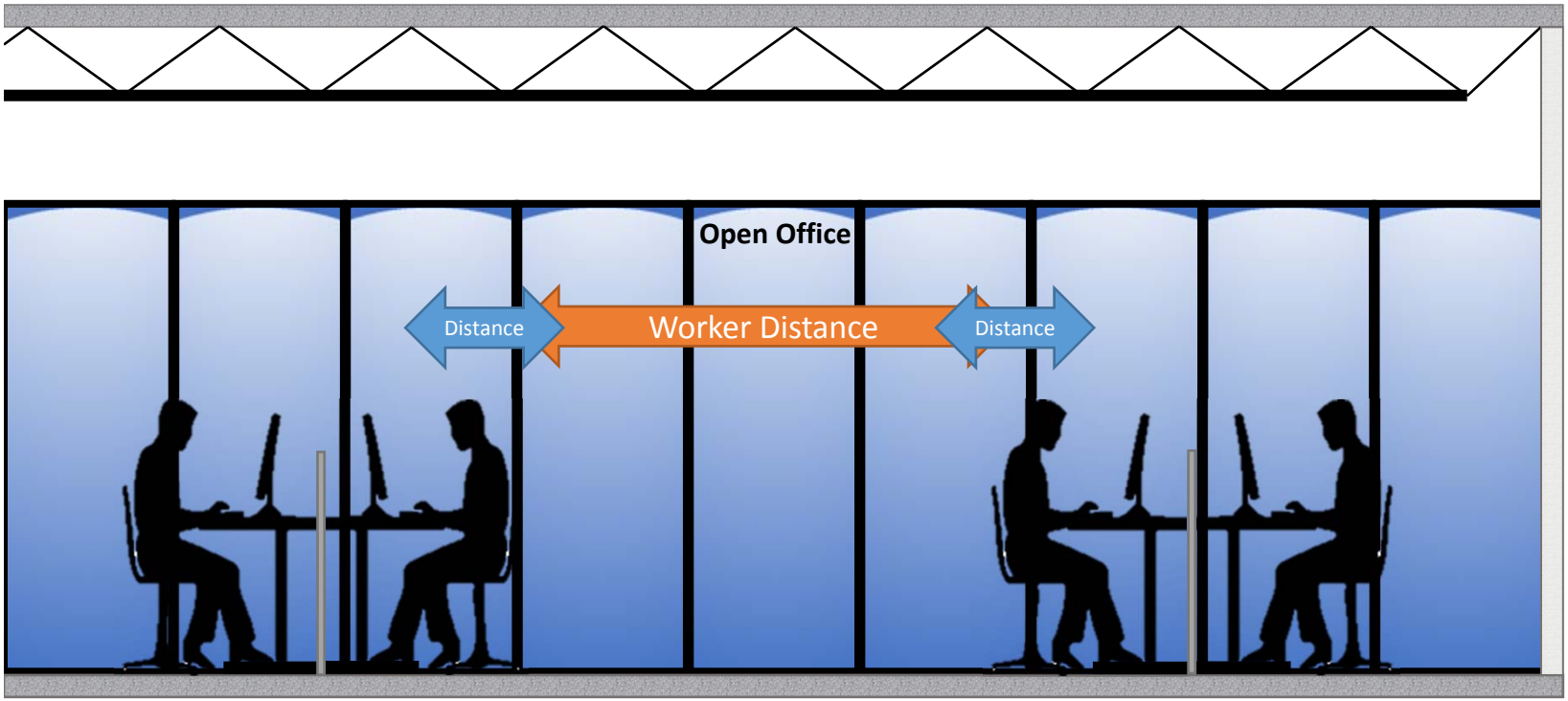
Lowered Partition Heights (Less Blocking)



Changes in Materials (Less Absorption)



Worker Density (Less Distance)



Sound Masking (More Covering)

How Sound Masking Works

Sound Masking

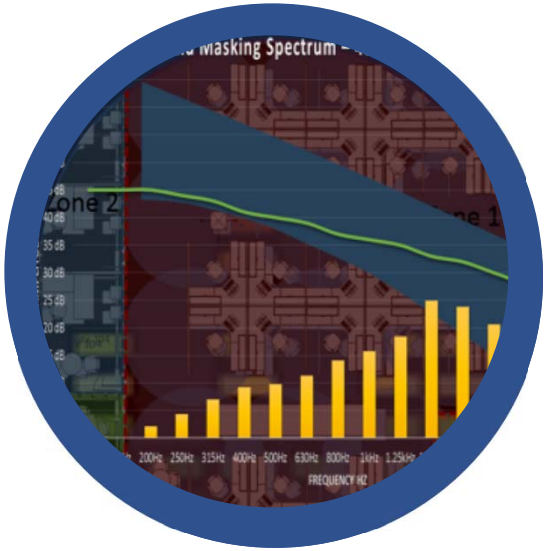
Sound Masking is the addition of a specifically tailored low level electronic & constant sound to an environment which lowers the signal to noise ratio of a talker, thus providing “speech privacy”.

Sound masking is effective when placed at the unintentional listener location by lowering the level of “speech intelligibility” of the talker’s signal.

Effective Sound Masking

Four Keys to Effective Sound Masking

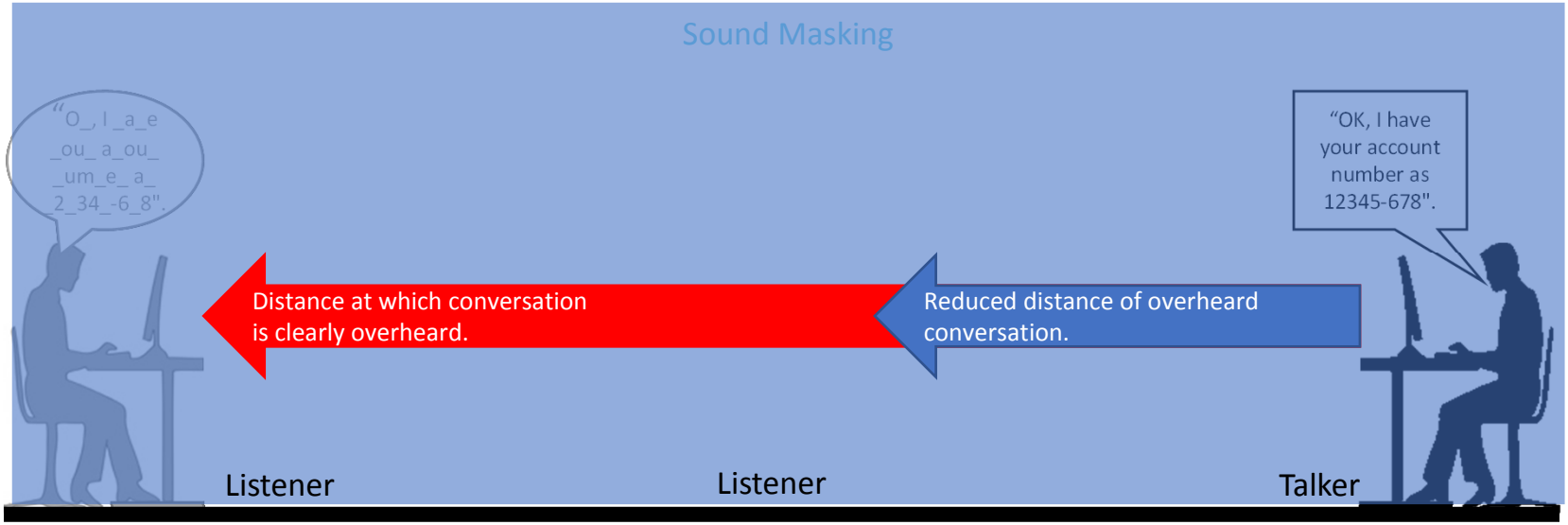
1. Must be an extremely uniform distribution of a constant sound spectrum (+/-1dB Spatial / Spectral Uniformity) which provided by a evenly spaced grid of loudspeakers or sound masking emitters.
2. Granular level adjustment of each “Zone” based on space functionality, client’s controllability needs, and paging requirements if any.
3. Is adjusted to utilize a specific frequency spectrum of non repeating sounds consisting of the same frequency content found in human speech.
4. Must be unobtrusive and not contain any discernable information.



Reducing Conversational Distances

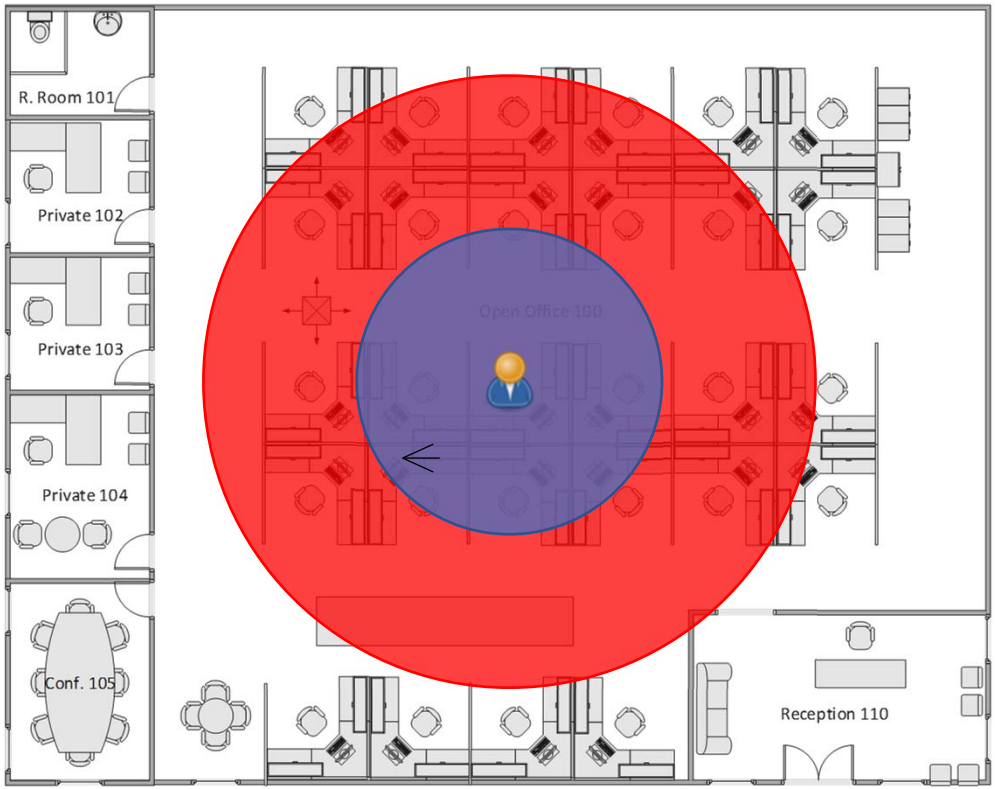
"By deploying sound masking, (i.e. reducing SNR) the distance at which intelligible conversations are overheard is greatly reduced leading to better speech privacy."

- Sound Masking



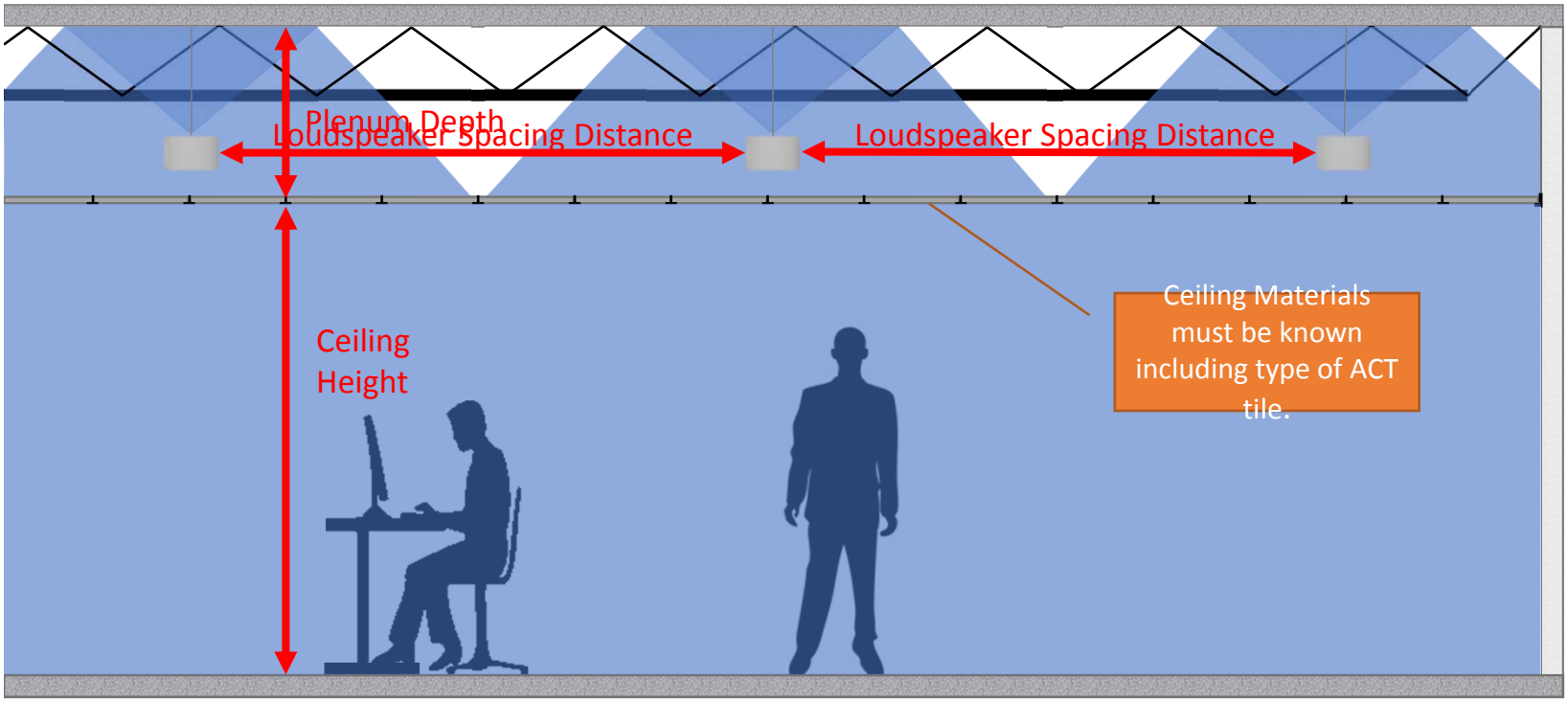
The Radius of Distraction

- The areas at which a persons conversation is “clearly intelligible” known as the “radius of distraction”. (shown in red)
- The addition of Sound masking lowers the signal to noise ratio thus reduces the radius of distraction. (shown in blue)
- The actual distances where intelligibility can occur will vary based on the acoustic conditions (absorption and blocking) within the space, including the furnishings.

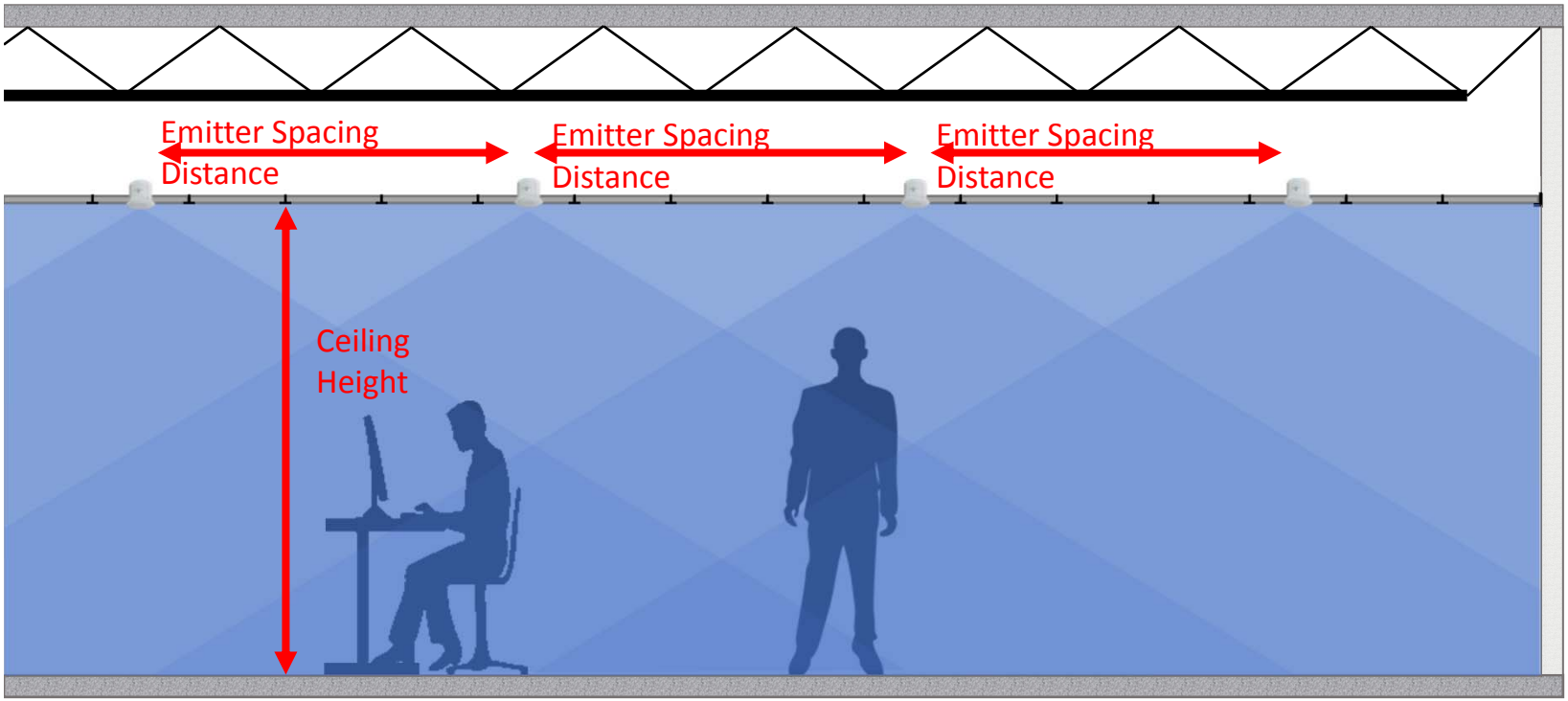


Types of Sound Masking Systems

Plenum (Indirect)



In Ceiling (Direct Field)



COVID-19 and its Effect on Workplaces and Sound Masking

COVID-19 and the Workplace

Open office-architecture:

- Staggered work schedules to foster proper distancing will create a lack of office-acoustic consistency.
- Noise distractions, speech privacy and employee comfort will likely become **MORE** problematic, not less.

More-traditional offices:

- Partitions between staff members, like Plexiglas and moveable screens.
- These highly reflective surfaces will dramatically alter an office environment's acoustics.
- Noise distractions, speech privacy and employee comfort become even more challenging.

COVID-19 and the Workplace – How Can Sound Masking Help?

No matter the extent to which office architecture might evolve because of COVID-19, the potential for noise distractions, lack of speech privacy, and insufficient employee comfort will remain.

- Sound masking will continue to be an important solution because it helps solve those problems.

Wrap Up

Speech Privacy

- The “Speech Privacy Crisis” in the working environments has reached critical mass driven by changes in architecture and furnishings due to the reduction in the amount “Absorption,” “Blocking” and decreased “Distance” between workers.

- Companies are losing productivity due the lack of Speech Privacy present in the workplace.
  - Making workers unhappy with their work environment
  - Presents potential liability risks
  - Costing them money

- By promoting sound masking, you can offer your clients a solution to these speech privacy issues with a very short ROI.

Sound Masking Solves Privacy Concerns

- Sound masking helps to restore reasonable levels of speech privacy in many environments.
- When absorption, blocking, and distance is removed, only covering from sound masking remains to improve speech privacy levels.
- Various sound masking design approaches may be taken dependent on the performance requirements, budget, and the architecture present.
- Good sound masking is unobtrusive to occupants by being spatially / spectrally consistent, using the proper sound spectrum, and is tailored in level for differing spaces within the facility.

Thank You!

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