

## Green Effects: Acoustical Comfort

### LEED V4 Indoor Environmental Quality: Acoustical Performance

In modern workplaces, there has been a trend towards open plan offices, which use individual workstations rather than traditional walled offices. With many employees regularly out of the office working from home or at satellite locations, the open office plan can be an effective and appropriate method of reducing space costs. However, if workers experience poor acoustic comfort some of the benefit may be offset through decreased productivity.

The intelligibility of speech is the degree to which speech can be understood, and is directly dependent on elements of the surrounding environment. Factors of the indoor environment affecting speech intelligibility include background noise level, reverberation time, and the size of the room.

Although the relationship between acoustic comfort in an office environment and productivity is still being studied, scientific research has shown:

1. Attention tasks were performed faster but with lesser accuracy in high noise (58 decibels) versus low noise (38 decibels, equivalent to that produced by ventilation) environments
2. Conversation noise had a greater negative impact to productivity than acoustic noise at the same level.
3. Foreign language conversation noise impacted productivity less than native language conversation noise.

Speech intelligibility can be quantified by the Speech Transmission Index (STI), for which values range from 0 (completely unintelligible) to 1 (perfectly intelligible). Acoustic comfort has been shown to be highest when STI is less than 0.2. Furthermore, studies have shown a productivity loss of 8 percent to occur when STI exceeds 0.5.

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