



The High Cost of Noisy Conference Rooms

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Keeping noisy conference rooms is costing businesses millions of dollars each year. The loss shows up in mistakes, miscommunications, delayed project schedules and decreased available human resources. Economic decision analyses are routinely performed to determine the effect of proposed capital improvements on cash flow. The effect on cash flow caused by improving conference room acoustics is particularly easy to estimate.

Conference rooms can be viewed as a communication medium - similar to the phone, internet, memos and mail. From the company's point of view, the annual cost of this medium is at least equal to the number of employee-hours expended in meetings multiplied by the average cost of those employees. For a company with 4 meeting rooms that are booked for 4 hours each day, with an average of 20 employees in attendance, each costing the company \$100 per hour, the annual cost is $4 \times 4 \times 20 \times 100 \times 250 \text{ days/year} = \8 million per year.

The acoustics of a space can be measured in various ways; however, the speech intelligibility rating is especially applicable for our analysis. The speech intelligibility index is a rating between 0.00 and 1.00 that tells how much information from the presenter is getting through to the listeners in the room. The measurement can be done in about half an hour. A typical conference room having a noisy HVAC system may have a speech intelligibility of 0.50 or less, meaning only half of what is said can be understood.

For this economic analysis, we will neglect the costs in mistakes and miscommunications that a 50% intelligibility causes and simply estimate the reduction in necessary meeting time if we improve the intelligibility to a modest 0.75 or 75%. Looking at the conference room as a medium to convey a given amount of information, a room with a 0.75 speech intelligibility rating is twice as efficient as the room having only a 0.50 rating. That is, it takes twice as long to correctly transfer the same amount of information in the 0.50 room as it does in the 0.75 room. That is to say, over the course of any one project, twice as many employee-hours are expected to be spent in the 0.50 rated conference room.

For the company in our example above, improving the speech intelligibility of their four conference rooms from 0.50 to 0.75 would save 50% or \$4 million per year. Since the cost in employee-hours generally tracks inflation, there is no reduction in present dollar savings over the entire life of the conference room. Therefore, the total present worth for the example company to improve the conference room acoustics is \$4 million multiplied by the expected life of the conference rooms minus the cost of the renovation. For a life of 10 years: Present worth = \$40 million - renovation cost.

The cost of the renovation will depend on a number of items, the most important of which is the number, proximity, type and level of noise sources in and adjacent to the conference rooms. There are too many variables to give a neat rule of thumb - except to say a full acoustic analysis and design should be performed if the estimated positive cash flow is substantially more than the original construction costs for the room.

The above economic analysis is conservative in one more way. For projects that are limited by the "small effective bandwidth" of the noisy conference room, modest improvements will shorten those projects, freeing up human resources for additional new projects.