



ACOUSTICAL CONSULTANTS

A photograph of a large, modern concert hall interior. The stage is made of light-colored wood and features a grand piano. The audience seating is arranged in a semi-circle, and the ceiling has a complex, dark structure with recessed lighting. The walls are dark with some textured panels.

Architectural

Acoustics

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overview



HFP provides architectural acoustic design for many spaces including: condominiums, hotels, convention centers, offices, boardrooms, recreational facilities, places of worship, and public and entertainment venues. More specifically, our architectural services include:

- Reverberation control/enhancement
- Room privacy assessments and sound isolation design
- Room acoustical testing, noise surveys, and problem diagnostics
- Predictive room acoustical performance through computer modeling
- Sound masking system design and tuning
- Air handler noise isolation
- Vibration measurement and control

markets we serve

- *Commercial*
- *Condos, Apartments, Hospitality*
- *Public Spaces*
- *Educational Institutions*
- *Specialty Areas*

The acoustical qualities of a space have a strong effect on productivity, comfort, and privacy.



markets > commercial

HFP performs extensive work in the commercial sector. We help businesses achieve speech privacy in open plan office and traditional office areas through better construction methods and/or sound masking systems. We ensure that boardrooms are isolated from intrusive noises that can disrupt important meetings.

Common areas in commercial buildings also play an important role in business. Often, customers are first greeted in atriums, employees eat lunch at the local cafeteria or food court, and quick meetings take place in walkways. In all of these situations, clear intelligible communication is key. No one wants to shout over a room's reverberation to make his or her point clear, and most want the ability of calling out to another from across the room. HFP can perform impulse testing in a space and recommend acoustical treatments to control reverberation.

- *Speech Privacy*
- *Noise & Vibration Isolation*
- *Reverberation Control*



markets > condos, apartments, hospitality

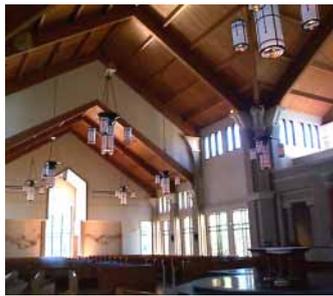
Noise and vibration isolation are priorities for condominiums, apartments, and hotels. *Steady state noise* contributors such as pumps, air handlers, and nearby industrial facilities can all impede comfort in one's dwelling be it temporary or permanent. Also unpleasant are *intrusive noises* such as conversations next door, footsteps upstairs, telephones, and televisions that can pass through floors, ceilings, and walls. *Structure-borne vibrations* can be re-radiated as noise and can also rattle light fixtures, pictures, etc. Complaints are likely if appropriate construction methods and materials are not used. HFP can advise on all acoustical and vibration issues facing condominiums, apartments, hotels, and more.



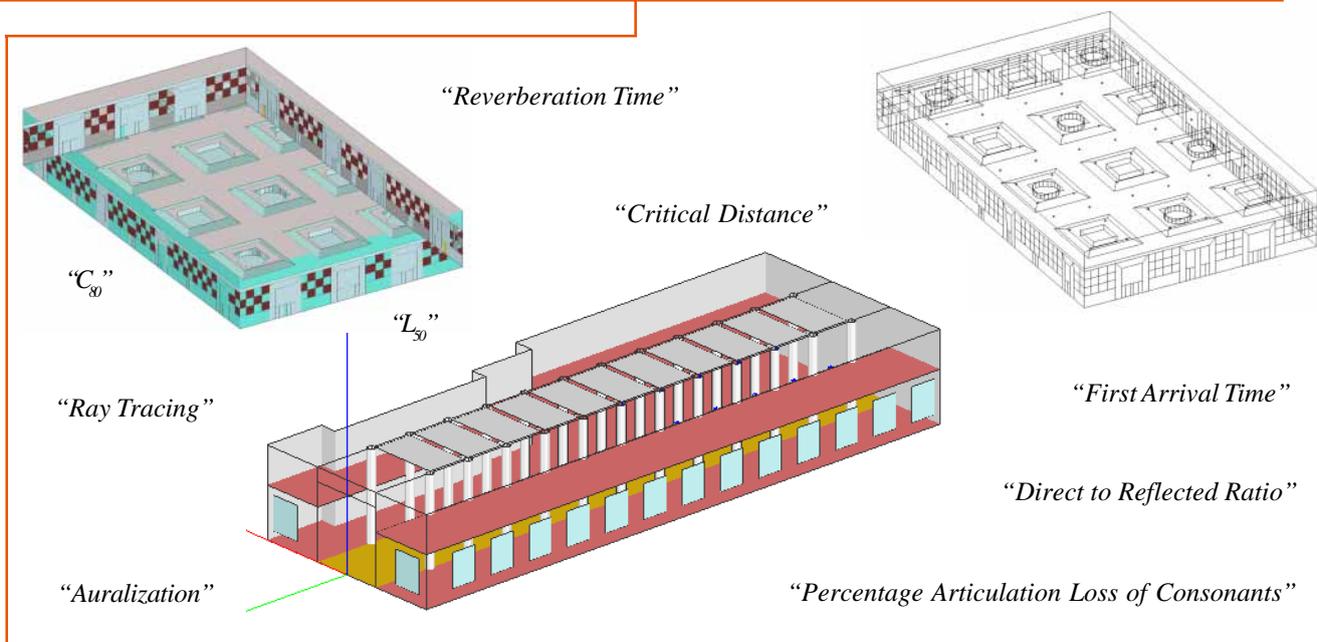
markets > public spaces

Public spaces impact the lives of many people at once. This increases the importance of favorable room acoustics. HFP has extensive experience in public venues including *convention centers, places of worship, performance halls, movie theaters, auditoriums, stadiums, arenas, restaurants, and fitness centers*. We have worked with the unique challenges associated with each space, adding to our extensive base of experience.

Desirable qualities in public spaces usually include good speech intelligibility. Some rooms may also need good to excellent musical response. Characteristics common to large-volume rooms include long reverberation times, poor impulse response, and a tendency to sound “shrill” if proper diffusion is not present. These can lead to low speech intelligibility, “muddy” sounding music, and natural acoustics that lack “warmth.”



Ideally, acoustical consulting should take place during the design phase of the project to ensure an efficient solution that works well with the aesthetics and the audio-visual system. Realizing that this is not always the case, HFP works pre- or post-construction to help ensure a favorable natural acoustical environment. We perform any required diagnostic work on site and create **3-D acoustical computer models** for predictive analyses. Our models can vary from general room acoustical calculations to in-depth impulse response studies. We can also create auralizations that allow our clients to actually hear audio demonstrations of room reverberation characteristics with different acoustical treatments applied in the computer model.

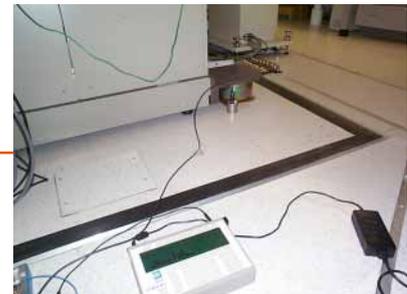


markets > educational institutions

HFP can provide expertise to help educational institutions deal with their unique acoustical needs. We have a wealth of prior experience plus acoustical and vibration data acquisition equipment and computer modeling programs to provide solutions for these educational spaces and more:

- **School auditoriums** host many functions, including speeches and awards presentations, choir and band concerts, plays and musicals, dance concerts, and movie showings. This type of space needs reverberation times, diffusion, and speech intelligibility characteristics that are compatible with these disparate functions.
- **Gymnasiums** host sporting events, assemblies, lectures, pep rallies, concerts, science fairs, and awards presentations. Proper reverberation control is crucial for any speech intelligibility, with or without an accompanying audio system. Adequate diffusion can make a gym space sound warmer and more comfortable. In other words, the gym won't sound like a "gym."
- **Scientific research laboratories** can require fume hoods that are in constant operation, but need to be quiet enough to allow for conversation in the lab. Acoustically treating air handling systems must be by unconventional means to keep duct linings from absorbing hazardous chemical vapors.

Vibration from elevators, mechanical equipment, footfalls, doors, etc. can adversely affect sensitive scientific equipment. Proper control or isolation of structure-borne vibration is essential to the reliable and accurate operation of this equipment.



markets > specialty areas

There are special applications and spaces requiring favorable acoustics that aren't seen as often as those in our other three markets. For instance, the designing of recording and production studios involves detailed acoustical investigations. The space itself must have a relatively neutral acoustical response allowing for critical listening of the music itself – not the music altered by the room's acoustics. Because recording studios are not found everywhere, their acoustical needs are specialized and require a high level of expertise.

Acoustical challenges, however, *are* everywhere. The automotive industry is always improving the noise and vibration rejection ability of vehicles. The importance of an automobile's interior acoustics is constantly growing as customers and manufacturers elevate their performance standards.

These are just a few examples of more unique areas that need acoustical consultation. HFP is eager to help find solutions to challenges of all types. ***Let us know how we can help you!***