

Noise Reduction in the Landscape:

There are four methods commonly used for sound attenuation that Thayer Nursery is planning on implementing to reduce the intensity of outdoor sounds before they reach the receiver. When trying to reduce noise levels it is important to absorb, deflect, refract and muffle intrusive sound as close to the source as possible.

1. **Sound Deflection and Reflection (Fence with Sound Attenuation)** – This method causes the noise to be bounced away from the recipient and sometimes back toward the source. We are proposing a fence constructed of wood with a sound panel attached. The closer the fence is to the sound source, the more the sound will be reduced. Often, a short fence close to the source will provide the same impact as a much larger structure further away. A wall-height barrier that screens the source from view is usually sufficient. When sound waves strike a hard surface, it does not vibrate so the waves are reflected back toward the source. That's why the freeway is so loud when it runs between two masonry sound walls. When sound waves strike a slightly flexible panel it will vibrate. This transforms sound waves into other forms of energy, and also deflects them off in different directions. The more flexible the material, the greater the deflection. Sound barrier walls reflect and deflect noise. It's also why sound absorption plants are used in conjunction with walls to catch the higher level sound.
2. **Sound Absorption (Vegetation)** – This method uses plants to entrap or absorb sound vibrations, particularly for large scale applications. Evergreens create attractive and effective partitions that may serve as a fence for privacy, but also double as a sound barrier. The plant material proposed will entrap or absorb sound vibrations. Plant material will help attenuate sound and “calm” the noise. Sound is absorbed by all parts of the plant such as leaves, branches, twigs and wood. The rougher the bark the better. Trees and shrubs that are evergreen and have branches that extend to the ground are the most effective. Planting live, green material is the most commonly used method for sound absorption.
3. **Sound Refraction** - This little known effect occurs when noise is dissipated, diffused or dispersed by striking a rough surface on any plain. Exposed soil or lawn space help absorb noise from low elevation sound sources. It's easier to understand using a room of your house as an example. If it is empty with a bare floor and walls, every sound bounces off the hard surfaces to magnify it or even cause a slight echo as it bounces around. Add carpeting and the echo vanishes. Outdoor surfaces coated in plants can have much the same effect. Due to their large areas and excellent refraction ability, the most powerful tool on the ground plain is exposed soil, lawn or soft garden beds. Beware of hard, sleek designs in outdoor environments; the emphasis on manufactured materials rather than plants can truly exacerbate the audibility of noise.
4. **White Noise** - This is a very different solution than the first three. White Noise is designed to create sound that is appealing to the human brain as a mask for undesirable noise. The most widely used method is a water fountain. Running water has long been employed to "drown out" extraneous noise and create a sense of serenity. Gurgling water creates a continuous sound that is in the same frequency range as other less desirable sounds, such as lawn mowers, air conditioners, and people talking, but because the fountain is nearby, its sound dominates. Additionally, vegetation inherently creates some white noise. Wind in evergreen needles and in leaves produces a distinctive sound. The rustle of stiff oak leaves or those of dry autumn ones can make problem noise seem minimal. In addition, these trees also attract birds and other wildlife that makes their own sounds further masking noise.