Soundscape planning is not about quietening—high quality soundscapes are not necessarily about low sound levels or about silence. What they are about is sounds that are appropriate to that place—achieving congruence between landscape and soundscape.

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Acoustic Design of Outdoor Space

I loved what I heard when I was in Catalunya Square, Barcelona: pigeons flapping and cooing; people walking; voices and children; the sounds of splashing water from the fountain. In truth, it was a loud place; full of sound, full of energy and vitality—and a delight to experience. All of the sounds present in this place made up its *acoustic environment*, and people's experience of this acoustic environment is the *soundscape of the place*.

My enjoyment of this place was enhanced by its soundscape. And if you take a close look at the activities and postures of the people in the photograph, they too were enjoying the environment this square provided. Of course, as an acoustician, I was very much aware of the acoustic environment of the place. While I do not make the assumption that others present were necessarily consciously listening as I was—it is not at all unreasonable to surmise that the acoustic environment *enabled* their enjoyment of this place. Sound is only one component of people's experience of place: there is also the visual experience, the temperature, the wind, the vegetation, the different materials of the surfaces, the physical safety of the place, their own activities and the activities of others present, their own motivations and expectations. While experts tend to dissect environments into their component parts, the reality is that people's experience is of the *whole* of their environment.

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Photography by Lex Brown

Despite this, we can justify a workshop focusing on just one of the components of place, the soundscape, as a necessary positive discrimination towards sound in the design and management of outdoor space. There is, currently, little attention devoted to this dimension relative to the attention afforded the visual, and other, dimensions of place.

Managing the sounds of places is soundscape planning, soundscape design, or soundscape management.

I have similar experiences of high quality soundscapes in many places: a waterfront/seascape in Helsinki (the sounds of waves on seawalls, gulls calling, the sounds from a small diesel-engined fishing boat); within the cavernous space of a restored indoor market place in Budapest (a dull babble of people buying and selling, occasional loud calls or laughter, trolleys moving across tiled floors); in a tiny garden park in the midst of downtown Manhattan (mostly the sounds from a water structure in a reverberant space). These high quality soundscapes have not only been urban places, but rural and country ones too, areas of outdoor recreation, and natural parks and wilderness. While the sources of sounds may be very different across these different domains, as may be the activities people undertake within them, there are some fundamental principles that underlie soundscape planning and management, and these principles are the same irrespective of the domain.

There is much we still do not know about soundscapes of the outdoor environment: how to properly measure people's experience of it; the effect on this experience of people's levels of engagement with the space/activity; visual/aural interactions; the potential restorative functions of soundscapes; or the role of listening states—analytical listening vs. distracted listening (Truax, 2001). The important question for this forum is: "Do we know enough to provide advice on soundscape design to design professionals", even with these present shortcomings in our knowledge. If, in any of the places I have described, the soundscapes were not accidents (most, I regret, probably were) is it possible to identify the underlying principles that made the soundscape of each of these places special? And, how can these principles be incorporated in a design process for the acoustic environment of outdoor space?

Firstly, is it not just a matter of making such places quieter? No. Quiet can be of importance in some soundscapes, but very few. As in Catalunya Square, Barcelona, many marvellous urban soundscapes are, if not loud, at least far from quiet. Even in wilderness, nature is very rarely quiet. One can be unequivocal: soundscape planning is not about quietening—high quality soundscapes are not necessarily about low sound levels or about silence. What they are about is sounds that are *appropriate* to that place—achieving *congruence* between landscape and soundscape.

One useful way to illustrate the underlying design principles for soundscape planning is by contrasting the way noise control and soundscape approaches differ. There is already quite a widespread understanding of the approaches of managing the outdoor acoustic environment through noise control. It is critical to identify how different the soundscape approach is to noise control (Table 1), and to avoid confusing the two. They are complementary, not competing (Brown & Muhar, 2004).

Table 1. *Comparison of Noise Control and Soundscape Approaches.*

Noise Control Approach	Soundscape Approach
– Sound as waste	– Sound as resource
– Concerns sound of discomfort	– Concerns sounds of preference
– Human response related to level of sound	– Preference often unrelated to level—quiet not the objective
– Measures by integrating across all sound sources	– Requires differentiation between sound sources: wanted sound from unwanted sound
– Manages by reducing level	– Manages by 'wanted sounds' masking 'unwanted sounds'

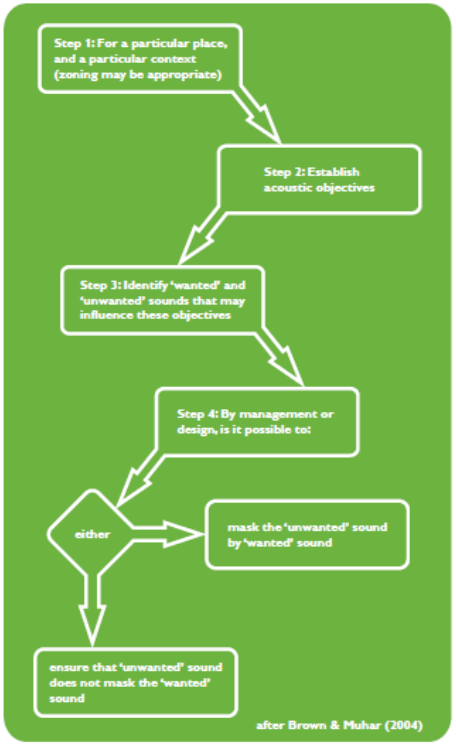
In noise control, sound is seen as a waste product—to be managed like all wastes. It deals with sounds that cause human discomfort. In fact the model underlying noise control is that the level of discomfort is proportional to the level of sound and that management is achieved by reducing its level.

The soundscape approach, by contrast, considers the acoustic environment as a resource. Rather than focussing on unwanted sounds that cause human discomfort, the concern is much more with the sounds people want, or prefer—and, critically, preference may, or may not, depend on the level of the sound.

What sounds do people prefer? The results from the available research (e.g., Zhang & Kang, 2007) are consistent and unsurprising: moving water—in all its forms; the sounds of nature—birds and animals, wind in trees; and the sounds of people (voices, footsteps, laughter, and singing) vis-à-vis mechanical sounds (transport, machinery, ventilators). Such human preference in any place is highly dependent on context. Within any particular setting, it is unlikely to be too difficult to gain consensus in indentifying which sounds are preferred.

The final two rows in Table 1 identify the final principle. Nearly all acoustic environments in outdoor places of interest will consist of sounds from many different sources. High quality acoustic environments result where the dominant sounds heard in a place are those that are wanted or preferred in that place, and/or that sounds that are not wanted or preferred in that place are not heard. In acoustic design terms, what needs to be achieved is to ensure that the wanted sounds are not masked by the unwanted sounds.

The design process for outdoor space, which incorporate these principles, includes 4 steps. Step 1 requires unambiguously defining the place of interest and context (who are the people involved, what are they doing, what are others doing, time of day, weather, motivations, expectations, and so forth.). In Step 2, the acoustic objectives for this place and context need to be established (using the normal processes by which planners gain community or focus group consensus in similar matters). Some example acoustic objectives, which take into account the soundscape design principles of preference and masking include: moving water should be the dominant sound heard; a particular (iconic) sound should be clearly audible over some area; hear, mostly, (non-mechanical, non-amplified) sounds made by people; not be able to hear the sounds of people; the sounds of nature should be the dominant sound heard; only the sounds of nature should be heard; suitable to hear unamplified speech (or music); suitable to hear amplified speech (or music); acoustic sculp-



The design process for outdoor space.

Photography by Lex Brown

Ensuring the iconic sounds of a bell tower can be heard through the village, and not masked by unwanted sources, would require management of levels from such sources (e.g., traffic, ventilation plants, amplified music, etc).

Hearing mostly the sounds of nature in a park, requires management of unwanted near and distant mechanical sounds to ensure they did not *always* mask the sounds of rustling leaves or bird calls. In the park, occasional human voices, or footsteps, are acceptable.

ture/installation sounds should be clearly audible; sounds conveying a city's vitality should be the dominant sounds heard.

Based on the principles in Table 1, and unlike noise control where acoustic objectives are usually specified in terms such as, "levels should not be greater than x dB", the objectives include specification of the wanted sounds in this place (e.g., moving water, nature, speech, music, church bells), sometimes the unwanted sounds (e.g., not be able to hear the sounds of people), and specification of the extent of masking required—whether masking should be *complete* (the only sound heard) or *partial* (the dominant sound heard). If planners complete Steps 1 to 3, acoustic specialists can be charged with investigating the opportunities for acoustic management and design in Step 4, using all of the skills and tools normally applied in noise management and acoustic design.

There are many candidate locations for soundscape planning, design and management: urban parks and gardens; country parks; recreational areas; malls and pedestrian precincts; and even some residential precincts. Opportunities are likely to be greatest when areas are being redeveloped, or in initial design stages. The design of outdoor acoustic space requires careful specification of acoustic objectives. Consideration of soundscapes in the planning and design of outdoor space can reinvigorate management of the outdoor acoustic environment. ■

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