

Revoicing the Urban Soundscape: a Case Study of Student Soundscape Design Interventions at RMIT University

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Abstract

Soundscape Studies students in the School of Architecture & Design at RMIT University, Melbourne, Australia were asked to create a soundscape intervention to transform the acoustic space of a campus site. The site is a social space activated by markets, student activities and conversation; however, a loud exhaust fan outlet creating a lo-fi environment dominates the acoustic space of the site. Students were asked to create a soundscape intervention in the space, in response to an imaginative-artistic approach to acoustic ecology: *the exhaust outlet is the voice of the city, speaking; can this voice be deciphered, transformed, augmented?* Students responded with live sound-art, musical and electroacoustic performances played through loudspeakers placed adjacently to the exhaust outlet, and transformations of the environment with interactive sound-making artifacts. The intervention project was informed by the acoustic ecology movement's maxim that anyone who cares to listen is a soundscape designer; as such students were encouraged to listen, apropos, creatively respond to the dominant sound of the space. The project aimed to demonstrate that city dwellers given the opportunity to creatively interact with their city soundscape, with the assistance of education and resources, could revitalise their city-relationship through soundscape design.

KEYWORDS: soundscape design, art, education

Introduction

Students were asked to complete a soundscape intervention as part of the cross-university elective, *Soundscape Studies*, in the school of Architecture & Design at RMIT University in Melbourne. The Soundscape Studies elective is an outgrowth of the Acoustic Ecology movement founded by Murray Schaffer in the early 1970's, under the name the World Soundscape Project (WSP). Two of the central themes of the WSP were to "educate students and field workers about acoustic ecology" (Torigoe, 1982, p. 15), and to promote the notion of all people becoming actively engaged in soundscape design: "The aim... is to get whole populations to listen more carefully and critically, as I believe they once did, and to learn the extent to which they can control their own acoustic environments..." (Schafer, 1993, p.

113). The soundscape studies elective was further informed by the work of Cresson, which takes an “urban, structural approach” to urban soundscape design (Hellstrom, 2003, p. 21). As discussed below the approaches to urban soundscape design by the Acoustic Ecology movement and Cresson are vastly different. Students were asked to consider both approaches in their response to the intervention, inspiring a creative relationship between themselves and the soundscape, such that their relationship with the city was revitalized through active listening, structural applications and artistic responses rather than the passive listening that characterises everyday urban soundscape relationships. Student responses to the intervention are discussed below. The paper also identifies how the outcomes of the interventions could be applied to a myriad of approaches that involve the public in creative relationships with their city through accessible creative design projects.

Intervention Site Description

Media theorists, Marshall McLuhan and Edmond Carpenter (1960), invented the term *Acoustic Space* as an alternative way to understand the properties of space: “The essential feature of sound (is) that it fill(s) space” (p. 67), thus rather than visually defining space, space can be understood through its sonic properties. The acoustic space of the intervention site (see figure 1) is dominated by the sound of a cylindrical exhaust fan outlet that removes air from the underground car park below. Directly above the exhaust outlet is an angled metal awning that further amplifies the sound by reflecting sound back into the space. The result is the space is dominated by consistently loud ventilation noise.



Figure 1 shows the intervention site. The exhaust outlet emits an airflow containing a constant sound source, which is reflected by the metal awning above. Note the speakers either side of the exhaust stack, and the performance space.

Students were asked to consider the relationships of two intertwining dimensions of space – acoustic and social. The site is considered a social space as it is a central space for people to both transition and congregate. Henri Lefebvre defines an aspect of space as social space, which is activated by the presence and action of people. Lefebvre (1991) states an “approach is called for today which would analyse not things in space but space itself, with a view to uncovering the social relationships embedded in it” (p. 89). Considering social relationships of the space in regard to its use by people was a part of the consideration for the interventions. As a primary entry point to popular RMIT amenities including the library, cafeteria and thoroughfare to the university’s main entrance, the space is also transitional. Simultaneously many students and staff stop at the site to talk, relax and eat lunch. There are also weekly markets and events held in the space, which means at times there are a large

number of people in the space. The site was selected for an intervention as the existence of a loud, redundant noise source is considered incongruent with active social spaceⁱ.

Applying Acoustic Ecology

In their analysis of the intervention site students were introduced to an Acoustic Ecology understanding of the space. Truax (2001) describes space as lo-fi when it can be defined as an “environment ... of poor quality, high noise, and distortion” and that “encourage feelings of being cut off or separated from the environment” (p. 23). Students were asked to consider what impact a lo-fi listening environment would have on the people inhabiting the space. Interestingly many students commented that they had never noticed the sound of the exhaust outlet before, but on becoming aware of the sound were surprised just how dominating it was, and how it affected their experience of the space. Students also noted their friends didn’t notice the sound at all. This demonstrated that people in urban environments are passive listeners rather than active listeners which according to Acoustic Ecology is a characteristic of lo-fi environments:

The introduction of low information [lo-fi] background sounds suggests a trend toward homogenous environments with poor acoustic definition. Such environments do not encourage more active types of listening, and their prevalence may prevent listeners from experiencing any alternative. (Truax, 2001, p. 27)

This observation was part of the incentive to develop a creative approach to the intervention, one that stimulated an alternative listening experience.

Schafer (1993) states that “the basis of all soundscape design ought to be to develop the artful patterning of what is already there” (p. 103), and also states in his seminal text *The Tuning of the World* that “(a)coustic design... is a matter of the retrieval of a significant aural culture and that is a task for everyone” (Schafer, 1977, p. 205). In accordance with these two statements students were empowered with the title soundscape designer and asked to consider this space from an acoustic ecology perspective, by repatterning the existent soundscape through a creative response.

Applying Cresson

Centre de recherche sur l'espace sonore et l'environnement urbain (CRESSON)ⁱⁱ is critical of the acoustic ecology approach and the term soundscape. Augoyard et al. (2006) state that the acoustic ecology approach “discredits a number of everyday urban situations impregnated with blurred and hazy sound environments, which would then belong to the lo-fi category”, and “question whether other than for the fields of aesthetic analysis, creation, and conservation, the use of the term soundscape remains useful and pertinent” (p. 7). Students were introduced to this alternative impression of the intervention site to inform their soundscape designs.

This alternative impression is further encapsulated by sound designer Bjorn Hellstrom, whose soundscape design practice utilises the Cresson approach:

...the majority of sonic environmental research today is concerned with protecting people from sounds. The opposite attitude promotes supportive and creative approaches to sounds. That is to say, by entering deeply into the very complexity of the sound world, we pursue knowledge that does not hide our relation to the sound world, but rather reveals its riches” (Hellstrom, 2003, p. 204).

It is in this context that Hellstrom (2003) suggests that “the knowledge field of sound art might be useful when approaching sound design” (p. 34), which is the approach students were encouraged to take when designing their interventions.

Cresson defines urban sounds through a compendium of sound effects defined from interdisciplinary perspectives. Sound effect is defined by Hellstrom (2003) as “a conceptual

tool to depict the context of sound in the sense that it embraces the interaction between human, spatial and physical dimensions” (p. 22). Sound effect terms explained by Augoyard et al. (2006) that were introduced to students include:

- » Mask - “the presence of a sound that partially or completely masks another sound” (p.66),
- » Drone - “the presence of a constant layer of stable pitch in a sound ensemble with no noticeable variation in intensity” (p.40),
- » Filtration - “a reinforcing or weakening of specific frequencies of a sound” (p.48).

These three effects were considered inherent in the intervention site and student analysis of these sound effects informed their interventions.

Project Description

After being introduced to various approaches to soundscape design, with an emphasis on the Acoustic Ecology and Cresson approaches described above, students were asked to approach the acoustic and social space of the intervention site with the following theme: *the exhaust outlet is the voice of the city, speaking; can this voice be deciphered, transformed, augmented?* The question is framed such that it calls for an artistic response to the existing sound environment. Considering the sound of the exhaust outlet as a voice destroys the notion that it is simply noise, and anthropomorphises the sound such that creative responses are encouraged that treat the urban soundscape as something alive and dialogical. Furthermore, the terms deciphered, transformed, and augmented call for an analysis of the acoustic characteristics of the sound and a sensitivity to the existing social conditions when considering the design.

As part of the project a shutdown of the exhaust fan was arrangedⁱⁱⁱ. Recordings of the site were taken during the shutdown, which students also experienced in real-time. Having being taught to listen actively through various exercises such as soundwalking, listening to soundscape compositions, and challenging passive modes of listening, students were amazed at how instantly human the space became when the dominant noise source was removed. A market was active during the shutdown and voices that were unintelligible murmurs suddenly became clear and coherent. This was further emphasized when students viewed the recording in sonogram form (see figure 2), which provided a visual metaphor for the vastly altered acoustic space.

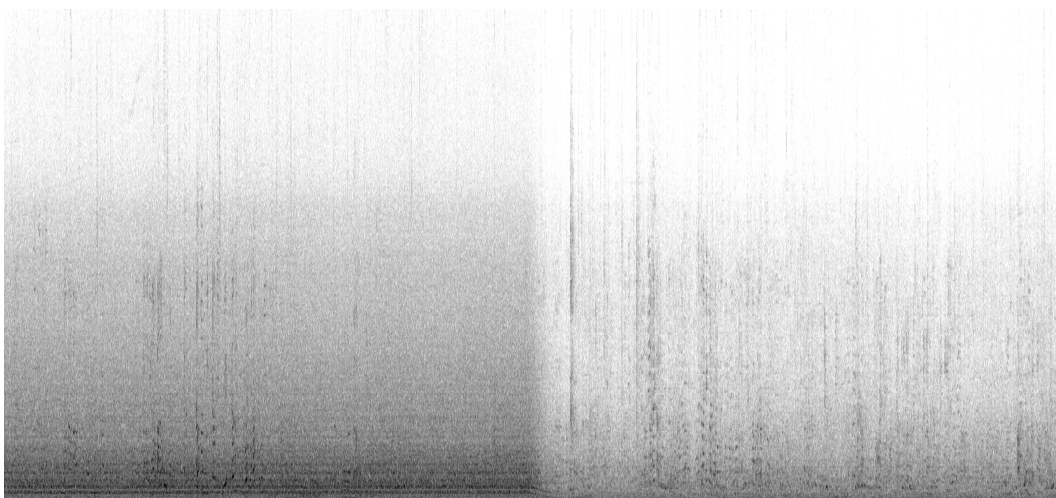


Figure 2 shows a sonogram of the exhaust outlet shutdown. The shutdown of the exhaust outlet removed from the acoustic space of the intervention site the dominant noise source, which resulted in the emergence of the sound of human voices and market activities.

Additionally, 1/3 band octave sound levels were recorded at the site and a significant decrease in volume of frequencies above 125Hz was identified suggesting amplification of the sound above this frequency, a phenomena caused by the metal awning. These analysis exercises emphasised the drone, mask and filtration sound effects described by Cresson, assisting students to identify analytical approaches to their interventions.

Materials provided for the intervention included two JBL speakers on tripod stands either side of the exhaust outlet, an amplifier to power the speakers, a mixing desk and leads. Students were responsible for their own soundmaking equipment, whether instrumental or physical artifacts. Each intervention was to last for a maximum of 15 minutes. Students had to identify themes for their interventions (described below), which related to the Acoustic Ecology and Cresson approaches described above. Some of the interventions were performative in that the students responded to the soundscape in real-time, altering it with their own soundmaking approaches. However it was emphasised that while sound art and performative approaches were encouraged this was to be considered a design intervention, such that the space was altered in accordance to its existence as both social space and acoustic space.

The Students

It is important to iterate that *Soundscape Studies* is a cross-university elective. This is in keeping with the principles of Acoustic Ecology, where the considered soundscape design objective to transform urban acoustic space is open to all. Students with minimal sound background are often involved in the course. In this case there were six music industry, two sound art, two landscape architecture and two engineering students, all from undergraduate courses. While some of them had musical experience, none of them had been exposed to soundscape issues and had not participated in sound design activities. Yet they all approached the intervention with enthusiasm and interest, due to the opportunity to consciously transform an acoustic space that is commonly beyond the power of people to transform. While it may be objected that introducing sound into space, such as busking, playing loud music and other sound activities, is a transformation of space, it is not necessarily a considered transformation. It is the dialogical relationship between listener and soundscape that made this a design intervention, and providing students with these conceptual tools provoked their sense of fascination; what is usually an unconsciously experienced given (the urban soundscape) became a conscious entity open to symbiotic transformation.

Description of Projects

The final five group interventions are discussed next. All interventions were recorded in ambisonic B format, and later mixed down to accompany video of the project work.

Attenuating Nature

Attenuating Nature considered the masking effect of the noise from the exhaust fan outlet in the surrounding space. To emphasise the masking effect natural sounds within the vicinity of the exhaust outlet were recorded, edited and mixed back into the site. This intervention deciphered the environment using the Cresson sound effect, Mask, while simultaneously embracing the Acoustic Ecology notion of the acoustic horizon^{iv}. The site was transformed by re-empowering the natural through the reintroduction of natural sounds into the site. Masked natural sounds identified near the site included birdsong, water movement (from a fountain), wind blowing through leaves of adjacent trees, human voice and footsteps. This intervention had an educational aspect as well as a creative aspect in that it made people

aware of the sounds that were being masked by the dominant sound, as well as transforming the acoustic space through creative inversion of the acoustic horizon.

Vent: the Musical

While the title is somewhat humorous it does capture the intent of the intervention. The dominant sound from the exhaust outlet was considered an accompanying instrument to a musical performance. All sound for the intervention was in reference to the drone emanating from the exhaust outlet. A cello was played using the dominant frequency identified in the sound, which happened to be A (440Hz). Additional sounds were from pre-recorded voices and location recordings, combined with performance by a live singer. This combination augmented the drone so that it sounded like a duet of voices, at times creating the sense that the voice was coming out of the exhaust stack. This intervention utilized the Acoustic Ecology aesthetic of considering the "soundscape of the world as a huge musical composition" (Schaffer 1975, p.205), by transforming the intervention site into a musical experience.

Exhaling Through Metal and Flesh

This intervention used approximately twenty different air-conditioning and ventilation sounds recorded from the RMIT campus. These sounds were introduced into the intervention site with the intention of transforming it into a symphony of air-conditioners. The filtration effect was considered through analysis of the amplification of the mid to high frequency range due to reflection from the overhead metal awning; samples with similar sonic characteristics were introduced into the space. Additionally, a human voice breathing in and out was sampled, which stemmed from the theme of the voice of the city. The exhaust fan sound was conceptualized by the group as a constant exhalation; by introducing sampled breath the sound was transformed into inhalation and exhalation giving creative life to the notion of the soundscape as the voice of the city. While this approach, which enhances the presence of lo-fi sound, would probably be considered aesthetically poor by the Acoustic Ecology movement, it is arguably more complimentary to the sound art approach as described above by Hellstrom (2003): "entering deeply into the ... sound world ... reveals its riches" (p.204).

Erhu and iPad

Erhu and iPad was a musical intervention that treated the exhaust outlet sound as an accompanying instrument. The intervention included the erhu, a stringed instrument originating in China, a virtual piano on computer and a pan flute application on an iPad. This was closer to a Muzak approach than either an Acoustic Ecology or Cresson approach to Soundscape Design. The group's stated intention was to make the listening environment more pleasant which has some similarities to the original Muzak philosophy which "carved out its niche by piping in stimulating music that motivated workers" (<<http://75.muzak.com/#/1940s/>>). There were some similarities to the Acoustic Ecology aesthetic in that the intervention intended to treat the soundscape as a composition and enhance it in this context. There was also some structural consideration, particularly playing in a key similar to the dominate frequency band of the exhaust fan, thus creating a sense of musical harmony in the space.

Jingle bells

Jingle Bells was unique in the context of the five interventions. It did not use electroacoustic treatments, rather using physical objects to create an interactive soundmaking site. The transitional dimension of the space was exploited in this design. Bubble wrap was placed on the ground so that people moving through the site created a short high-pitched popping sound with their feet, an interesting counterpoint to the lo-mid frequency drone of the exhaust outlet. Additionally, wind chimes were placed on the end of a tripod and suspended

over the air exiting from the exhaust fan. The force of the air caused the wind chimes to move which introduced further high frequency sounds into the space. This brought attention to the physical existence of emitted air, thus serving an educational role in raising awareness of the source of the sound dominating the acoustic space.

The tripod was wrapped in bubble wrap creating the effect of a synthetic tree and groundcover. Some people popped bubbles on the tripod causing the wind chime to move thus introducing two sounds into the site. Additionally people tended to stamp their feet louder or jump over the bubble wrap; these gestures elicited laughter and conversation, further adding to the sound environment. This intervention was unique in that it had the effect of redesigning the soundscape, while simultaneously encouraging gesture, and stimulating the transformation of social space from a controlled space to a more communicative and playful space. Jingle Bells acted outside of the Acoustic Ecology and Cresson paradigms instead introducing an element of architectural play, in which “(u)nfamiliar physical and social experiences in which we normally would not participate can be encouraged through play”. (Franinovic, 2010, p. 6)

Evaluating the Affects of the Soundscape Interventions

A theme for discussion between the soundscape studies group after the completion of the soundscape interventions was a reflection of the effectiveness of the interventions. In short there was a unanimous feeling that the interventions had been successful from personal, group and class perspectives. The opportunity to transform the soundscape through an active listening experience was deeply rewarding for the students and gave them new perspectives on the city soundscape, its richness, diversity and openness to creative dialogue. (Formal class satisfaction surveys administered by the University demonstrated a 100% satisfaction rate with the course, based primarily on the soundscape intervention).

However, it was equally unanimous that the affect on other people in the space, with the exception of Jingle Bells, was negligible. Students concluded that the majority of people walked through the space without noticing the introduced sounds, and seemed as unaware of the transformed acoustic space as they were of the original acoustic space. There could be many reasons for this, but the overall synthesis of conversation was that people are passive listeners and have not been educated to notice the sounds of the city or to meaningfully participate with the sounds of the city. This conclusion resonates with a primary concern of the Acoustic Ecology movement, ear-cleaning, which is “a systematic program for training the ears to listen more discriminately to sounds, particularly those of the environment” (Schaffer, 1977, p.272); and of Cresson’s identification of sound effects in the urban environment to encourage the “listening (of) sonic effects and developing the capacity to identify them (as) part of a rehabilitation of general auditory sensitivity” (Augoyard et al., 2006, p.13).

Jingle Bells attracted more attention from people in the space, which may be due to the visual nature of the intervention. As a visual society people are more attuned to visual transformations than aural transformations. However, the very existence of this soundscape design intervention forms part of the process of encouraging people to listen attentively and participate in the process of soundscape design through active listening, where the aural conditions of a city are realised to be just as pertinent as the visual conditions.

Untangling the Power Complex

It is interesting to note the web of power relationships that intersected at the intervention site, which can be explained in the context of the following text from Lefebvre:

As a body of constraints, stipulations and rules to be followed, social space acquires a normative and repressive efficacy ... that makes the efficacy of mere ideologies and representations pale in comparison. (Lefebvre, 1991, p. 358).

The intervention demonstrated that the capacity for a person living in a city to appropriate a space and communicate with the city in a creative context is not possible without prior effort to disentangle a web of power complexes. As Lefebvre states, "(s)pace commands bodies, prescribing or proscribing gestures (Lefebvre, 1991, p. 143); thus, the freedom to creatively intervene does not exist. Consequently an analysis of the socio-political constraints on human activity becomes an important adjunct to the act of soundscape design.

In this educational context the educator was able to disentangle the web so that students could engage in a free-flowing dialogue with their city. The importance of support from governing authorities to disengage power impediments before creative soundscape design approaches by the public becomes the norm is clear (unless a rebellious stance is taken in which case the loss of equipment and liberty is at stake!). Over a period of three months the following university departments were contended with on a weekly and sometimes daily basis: health & safety officers, fire services, facility services, property services, audio-technical manager, ethics committee, the student union, market stall holders, and client-relations managers. Additionally cleaners complained on the day that their route to near-by rubbish bins were being blocked, security kept a presence, and occasional passers-by surveyed the area and made concerned phone calls. There is more that could be written about this experience, however in the context of this paper it is raised to demonstrate challenges to creative soundscape design in the city.

Future Work

This student-led soundscape intervention was inspired by previous work of the author in identifying the homogenous ubiquity of ventilation and air-conditioning noise in many of Melbourne's supposedly quiet areas. See Lacey and Harvey (2011a) for an extended discussion. This process led to the question of how this homogenous sound agent could be challenged. The concerns raised in the 2011 paper were strongly influenced by the Acoustic Ecology movement; however, under influence from the analytical and creative approaches of Cresson and Hellstrom, rather than taking a negative approach through identification of a noise issue, creative solutions have been sought. This began with a recommendation to 'explore the possibilities of listeners... hav(ing) their sonic creations interrelate with existent soundscapes via playback through electroacoustic soundscape systems' (Lacey & Harvey, 2011b, p. 119), and has evolved to listener-led interventions based on analysis and creative response. The student led soundscape interventions described in this paper are an important step in this process. Future work will involve the growth of such approaches into the public sphere so that the everyday may become integrated within soundscape design opportunities throughout the city. Ideally local governments would support such an initiative by removing hindering power complexes that control social space, and encourage people to enter into a creative dialogue with their city. The implications for this regarding people's sense of connection, enthusiasm and interest for their city is unknown. However, the experiences inherent in the student interventions described in this paper suggest that given the appropriate resources and education, the opportunity to creatively engage with city soundscapes leads to meaningful and thoughtful responses that can revitalise the relationship between people and their city.

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Footnotes

- i For other examples of campus based soundscape learning projects, see Cain, Jennings, and Poxon (2011); Lawrence, Martinelli, and Nehmer (2009); Xiaoyun (2004); Dietze (1999); and Sheridan and VanLengen (2006).
- ii Further information on Cresson can be retrieved from the following website: <http://www.cresson.archi.fr/ACCUEILeng.htm>.
- iii A similar exercise was undertaken in 2005. See (Harvey, 2008, p. 56).
- iv Acoustic horizon is defined as “(t)he farthest distance in every direction from which sounds may be heard”. Truax, B. (1978) Handbook for Acoustic Ecology, Retrieved from http://www.sfu.ca/sonic-studio/handbook/Acoustic_Horizon.html.