



## **Sounding Brighton: practical approaches towards better soundscapes**

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**“Sounding Brighton” is a collaborative project exploring practical approaches towards better soundscapes focusing on soundscape issues related to health, quality of life and restorative functions of the environment. The project provides the opportunity to raise awareness and promote communication on soundscapes among the general public, stakeholders and those involved in policy, including encouraging exploration of new ways of listening in local soundscapes, and new ways of tackling noise and improving local soundscape quality. The project is working to provide opportunities to discuss how soundscape concepts might, alongside tackling conventional noise problems, contribute to local planning and environmental improvement as part of a citywide engagement process in the city of Brighton & Hove in England in the United Kingdom. A range of environments: e.g. city centre, entertainment venues, seafront, foreshore, historic terraces, squares, lanes, parks and gardens are being considered. A soundmap of the city is being developed; a public outreach exhibition has taken place; and a night noise intervention pilot study has been trialed to explore the relationship between soundscapes and the brain and their effects on human behavior. The work is being further developed to better understand the effect of soundscapes on community well being, social cohesion and the physical and mental health of individuals.**

## **1 INTRODUCTION**

As the European Noise Directive illustrates, management of the acoustic environment is currently predominantly focused on sound levels and noise mitigation (EC, 2002)<sup>1</sup>. Consequently, its objective is to reduce sound levels below an acceptable guideline value (cf. WHO, 2000)<sup>2</sup>. Noise researchers have started to realize that the current approach to the acoustic environment needs to be complemented with an approach that acknowledges the positive aspects of the acoustic environment (e.g., Brown & Muhar, 2004)<sup>3</sup>. A strict focus on acceptable guideline values may be counter-productive, because once they are reached there are no incentives for further improvements. As a result of these insights, some noise researchers adopted the concept of ‘soundscape’ in the late 1990s (Schulte-Fortkamp & Dubois, 2006)<sup>4</sup>. This marked a paradigm shift in the way noise researchers studied the acoustic environment.

The term ‘soundscape’ refers to the acoustic environment of a place, like a residential area or a city park, as perceived, experienced or understood by people, in context (cf. Axelsson, 2011; ISO, 2012)<sup>5,6</sup>. It is the acoustic equivalent to ‘landscape’ (cf. Council of Europe, 2000)<sup>7</sup>, and includes all sound sources, wanted as well as unwanted. Managing the sounds of places can, therefore, be referred to as ‘soundscape planning’ (e.g., Axelsson, 2011)<sup>8</sup>. Unlike the current approach to managing the acoustic environment, soundscape planning is not primarily about reducing sound levels. Soundscape planning is not even necessarily a question of how loud sounds are, but rather what sounds are appropriate to, or belong to a place. There is no one ideal soundscape; and what is deemed an appropriate soundscape can change over time to reflect the evolving needs and/or uses of an area. To decide which soundscapes are good (i.e. appropriate), it is necessary to consider which activities the soundscape may enable at a place (Brown & Muhar, 2004)<sup>3</sup>.

Before the onslaught of visual media the importance of sound, hearing and listening was overtly understood to be critical to life. But in modern life, we are continually bombarded by

noises, and listening has, for many of us, become of secondary importance to the visual sense. To help respond to this need and encourage better public understanding of the associated issues, the Noise Abatement Society (NAS) developed the “Sounding Brighton” programme supported by the European Union COST (European Cooperation in Science and Technology) Action TD0804 on the “Soundscapes of European Cities and Landscapes”; and the International Organization for Standardization Working Group 54 on “The Perceptual Assessment of Soundscape Quality”.

## **2 THEORY**

The present paper reports the results from two applied soundscape pilot studies conducted in the City of Brighton & Hove in the United Kingdom.

### **2.1 Soundscape map of the City of Brighton & Hove**

The first explores the possibility of integrating a soundscape approach with a recent method for spatial planning and land use management called sociotope mapping. Sociotope mapping was developed in Stockholm, Sweden, to help avoid conflicts between residents and the city administration when increasing the density of the city space (Ståhle, 2002, 2003, 2006)<sup>9,10,11</sup>. A sociotope map is developed through user surveys, where urban planners are informed about how residents use and value urban open spaces from a social point of view. Together with expert assessments, this results in a GIS (Geographic Information System) map with areas marked in different colours representing their user values (e.g. enjoying the street life; nature appreciation; playing with one’s children; or having a picnic). The sociotope maps then help the city planners to take the user values into consideration in the planning process. In Brighton & Hove this model is being adapted to encompass soundscape, by incorporating the sounds people find appropriate to the sociotope into the maps.

### **2.2 Night noise intervention pilot using a soundscape approach**

The second explores how applying soundscape concepts in the city’s busiest clubbing and entertainment district could improve crowd behavior leading to less anti-social behavior and violence. To do this on 29<sup>th</sup> October 2011, the NAS along with Brighton & Hove City Council, Brighton & Hove Arts Commission and the EU COST Action TD0804 on the “Soundscapes of European Cities and Landscapes” co-commissioned a series of sonic artworks, produced especially for “White Night”, the city’s annual all night arts and cultural festival. The works were designed to provoke debate, challenge notions of sound in public spaces and initiate innovative explorations to help solve noise disturbance in urban environments. The project was part of White Night’s commitment to ‘new work’ and ‘new approaches’ through cultural solutions for wider social concerns.

## **3 RESULTS**

### **3.1 Soundscape map of the City of Brighton & Hove**

#### **3.1.1 Questionnaire**

To explore the relationship between soundscapes and sociotopes, we conducted a social survey, using an electronic questionnaire that consisted of four sections. (1) To allow

respondents the opportunity to register complaints about noise, as a service to the community (see Section 2.2, paragraph 2, below) the first section concerned noise annoyance. It was based on the ISO/TS 15666 question with verbal rating scale (ISO, 2003)<sup>12</sup>, with the amendment that the response category ‘Not at all’ was divided into the two response categories ‘Not at all (don’t hear it)’ and ‘Not at all (hear it but not bothered by it)’. Sections (2) – (4) then concentrated on local soundscape quality as follows: (2) In the second section the respondents were asked to name their favourite outdoor location in Brighton or Hove, and to indicate to what degree a list of 27 social and recreational activities would be suitable in this location (6-point category scale: ‘Don’t know/not applicable’, ‘Not at all’, ‘Slightly’, ‘Moderately’, ‘Very’, ‘Perfectly’). (3) In the third section the respondents were asked to indicate to what degree a list of 29 sound sources would be appropriate in the favourite location (5-point category scale: ‘Not audible’, ‘Slightly audible’, ‘Moderately audible’, ‘Clearly audible’, ‘Completely dominant’). (4) The fourth, and last, section concerned demographic data, such as in what area of Brighton or Hove the respondents live, gender, age, as well as occupation.

### **3.1.2 Participants**

The participants were residents in Brighton or Hove, 15 years of age and older. They were recruited via advertisements in local newspapers, via Local Action Teams (residents groups organised by the City Council; <http://www.safeinthecity.info/>), and via the Noise Abatement Society’s local network of contacts.

The recruitment materials invited residents of the city to ‘have their say’ about ‘how they experienced local sound quality’. This wording was particularly important in order to differentiate the activity from traditional approaches to surveying for noise annoyance. In other words, the project was specifically designed to gather data about local soundscape quality as its primary purpose. Nearly 700 persons visited the electronic questionnaire. Out of all visitors, 537 completed the first section on annoyance, 395 completed also the second section on favourite location, 382 completed the third section on appropriate sounds, and 354 completed the entire questionnaire, including the fourth section on demographics data. Out of the 354 respondents who completed the entire questionnaire, 182 were females and 172 were males. A majority lived in the most highly noise exposed central parts of Brighton & Hove, and were 35–69 years old. With regards to occupation, 70 % were employed, 17 % retired, and 8 % self-employed. The remaining 5 % were unemployed or students.

### **3.1.3 Scope**

The present report concentrates on the relationship between sociotopes and soundscapes, and presents the results for the second and third sections of the questionnaire.

### **3.1.4 Sociotopes**

To identify the number of different kinds of sociotopes among the named favourite locations in Brighton & Hove, the 395 complete responses to the 27 variables of the second section of the questionnaire were analysed. First, the verbal data was transformed to a numerical 6-point scale (0–5). Secondly, the 395 × 27 matrix was subjected to a hierarchical cluster analysis, and the 395 rows in the matrix were clustered (SPSS 19 for Windows; Squared Euclidean Distances; Furthest Neighbour/Complete Linkage). Inspection of the agglomeration

schedule, as well as a range of potential solutions, revealed that 5 main categories of sociotopes could be identified in the data. Separately, for each of the 5 categories, median values were calculated for each of the 27 variables. Then, for every category, the variables with the highest median values were used to interpret and name the 5 sociotopes. In addition, the names of the favourite locations that the respondents provided were used to guide the interpretation.

The first sociotope was most highly associated with the variables ‘Appreciating the sea’, ‘Appreciating landscape/scenery’, ‘Walking, jogging’, ‘Wind/wave/kite surfing’, and ‘Swimming/bathing’. The median values for these variables were all above 4.0, indicating that these social and recreational activities were found very suitable for the first sociotope. This sociotope was named ‘Beach & Seaside’ (N = 149). The second sociotope was most highly associated with the variables ‘Appreciating landscape/scenery’, ‘Walking, jogging’, ‘Appreciating parks and gardens’, ‘Individual outdoor exercise’, and ‘Picnic/barbecue’. The median values of these variables were all above 3.0, indicating that these social and recreational activities were found moderately suitable for the second sociotope. This sociotope was named ‘City Park’ (N = 117).

The third sociotope was most highly associated with the variables ‘Appreciating landscape/scenery’, ‘Walking the dog’, ‘Walking, jogging’, ‘Appreciating wildlife’, and ‘Experiencing peace and quiet’. The median values of these variables were all above 4.0, indicating that these social and recreational activities were found very suitable for the third sociotope. This sociotope was named ‘Peri-Urban Recreation Area’ (N = 56). The fourth sociotope was most highly associated with the variables ‘Appreciating landscape/scenery’, ‘Appreciating wildlife’, ‘Experiencing peace and quiet’, ‘Appreciating parks and gardens’, and ‘Watching people go by’. The median values of these variables were just above 2.0, indicating that the social and recreational activities were not strongly associated with the fourth sociotope. That this sociotope often was associated with “My own garden” indicates that this is a place where the individuals could relax and ‘be themselves’. This sociotope was named ‘My Space’ (N = 44).

The fifth sociotope was most highly associated with the variables ‘Watching people go by’, ‘Experiencing active street life’, ‘Eating (Café, Cafeteria)’, ‘Outdoor events’, and ‘Walking, jogging’. The median values of these variables were all above 3.0, indicating that these social and recreational activities were found moderately suitable for the fifth sociotope. This sociotope was named ‘Downtown City’ (N = 28).

### **3.1.5 Soundscapes**

To identify the number of different kinds of soundscapes among the named favourite locations in Brighton & Hove, the 382 complete responses to the 29 variables of the third section of the questionnaire were analysed, using the same method as for sociotopes above. Among the 382 cases, 5 main categories of soundscapes could be identified.

The first soundscape was most highly associated with the variables ‘Birdsong’, ‘Wind in trees, etc.’, ‘Other wildlife’, ‘People walking’, and ‘Seagulls’. The median values of these variables were all above 2.0, indicating that these sound sources were found appropriate when moderately audible in the favourite location. The first soundscape was named ‘Urban Nature’ (N = 132). The second soundscape was most highly associated with the variables ‘Birdsong’, ‘Wind

in trees, etc.’, ‘Seagulls’, ‘Children playing’, and ‘People talking’. The median values of these variables were just above 1.0, indicating that these sound sources were found appropriate when slightly audible in the favourite location. This means that sounds should only be heard in the background, and not be present in the foreground. The second soundscape was named ‘Distant Nature’ (N = 88).

The third soundscape was most highly associated with the variables ‘Seagulls’, ‘People shouting’, ‘Road traffic’, ‘People talking’, and ‘Amplified music’. The median values of these variables were close to 2.0, indicating that these sound sources were found appropriate when moderately audible in the favourite location. The third soundscape was named ‘Urban’ (N = 85). The fourth soundscape was most highly associated with the variables ‘Flowing water’, ‘Seagulls’, ‘Children playing’, ‘People walking’, and ‘People talking’. The median values of these variables were near or above 2.0, indicating that these sound sources were found appropriate when moderately to clearly audible in the favourite location. The third soundscape was named ‘Seaside’ (N = 55).

The fifth soundscape was most highly associated with the variables ‘Seagulls’, ‘People walking’, ‘Children playing’, ‘People talking’, and ‘People shouting’. The median values of these variables were all above 2.0, indicating that these sound sources were found appropriate when moderately to clearly audible in the favourite location. The third soundscape was named ‘Urban Beach’ (N = 22).

### **3.1.6 Sociotope-Soundscape concordance**

To investigate the concordance between the 5 sociotopes and the 5 soundscapes, a  $5 \times 5$  contingency table was created based on the 381 respondents who had completed both the second and the third sections of the questionnaire (Table 1). A Chi Square analysis shows that the distribution of the data in Table 1 is statistically significantly different from that expected by chance (see numbers in brackets) ( $\chi^2 = 126.0$ ,  $DF = 16$ ,  $p < 0.001$ ). This shows that there is a relationship between the social and recreational activities that people find suitable in their favourite outdoor location and the degree to which they find that specific sound sources are appropriate there.

Table 1 shows that ‘Beach & Seaside’ sociotope was strongly associated with ‘Seaside’ and ‘Urban Beach’ soundscapes, and weakly associated with ‘Distant Nature’ soundscape. ‘City Park’ sociotope was associated with ‘Urban Nature’ and ‘Distant Nature’ soundscapes, but very weakly with ‘Seaside’ soundscape. ‘Peri-Urban Recreation Area’ sociotope was strongly associated with ‘Urban Nature’ and ‘Distant Nature’ soundscapes. ‘My Space’ sociotope was most strongly associated with ‘Distant Nature’ soundscape. Finally, ‘Downtown City’ sociotope was strongly associated with ‘Urban’ and ‘Urban Beach’ soundscapes, but weakly with ‘Urban Nature’ and ‘Distant Nature’ soundscapes.

## **3.2 Night noise intervention pilot using a soundscape approach**

### **3.2.1 Rationale**

The soundscape intervention pilot, named “West Street Story:Come Together”, set out to trial an antidote to the Saturday night drinking culture by creating immersive sound

‘occupations’ which would change and soothe the noisy atmosphere of a raucous street on a Saturday night, called the ‘worst street in Brighton’ by many locals, to see if playing ambient sounds into the street could moderate anti-social behaviour.

The effects on body language and deployment of police resources were the metrics used to assess the indicative effectiveness of the intervention. These metrics were chosen specifically to help evidence the effects of overall sound quality on receptors as separate from noise levels.

The experiment took place during “White Night”, an all night arts and cultural festival arranged by the City of Brighton and Hove. The festival’s theme of ‘Utopias’ enabled the focus of the pilot to be on how sound could evoke the installation’s goal of creating a place of togetherness, joy and peace; and therefore, to show a noticeable result this needed to be demonstrated in a difficult area like West Street. The festival enabled the project to take a creative, unconventional and collaborative approach to challenging issues. Combining arts and social action in an upbeat party atmosphere sent a positive, non-judgmental message, promoting cohesion rather than entrenchment in established views. A core aim of the festival is to make use of the city’s cultural resources to enable creative interventions that address city issues. The impact of alcohol abuse is an increasing problem for Brighton & Hove. 27% of adult drinkers are estimated to be binge drinkers and at weekends the city is a destination for clubbers and drinking. West Street with its pubs and clubs is designated as a ‘stress area’ by police.

The scientific premise for the experiment was based on research compiled by Dr Harry Witchel, Discipline Leader in Physiology at Brighton and Sussex Medical School, in the United Kingdom, in his book “You Are What you Hear: How Music and Territory Make Us Who We Are”<sup>13</sup> which proffers that music can engender psychobiological territorial and pleasure responses depending on whether listeners like what they hear. In this way music makes a space a place. Organised ambient soundscapes are a form of music and therefore can perform a similar function in making places enjoyable and welcoming. Certain sounds provide humans with a feeling of comfort through hormonal secretions, making them less stressed and excitable and therefore less likely to behave badly. These sonic cues could range from distant club sounds, to organic sounds, to certain type of music or other ambient noises.

### **3.2.2 Installation description**

“West Street Story:Come Together” was comprised of two parts conducted simultaneously in different locations in the city. Firstly, “West Street Story”, an original 3D outdoor soundscape installation transforming the atmosphere and ambience in the heart of Brighton’s cacophonous clubbing area, was created by Martyn Ware of The Illustrious Company. Martyn, a founder member of bands The Human League and Heaven 17, is a musician committed to helping the public understand positive soundscaping. Situated in part of West Street, in the heart of Brighton’s night life, the installation consisted of two rows of speakers placed on opposite sides of the roadway and created a 3D soundscape cube, through which people walked. Martyn presented original compositions of both recorded and live sounds from a kiosk at the side of the street. The soundscape presented a contrast to the raucous disharmony so frequently heard in lively areas at night, and connected with visitors to the area and residents, as well as those exiting the clubs. Secondly, “Come Together”, a special event exploring ‘sound and rapport’, took place in Brighton University’s Sallis Benney Theatre, where audio from West Street Story

and live footage of crowds in the West Street area was filmed and broadcast by Driftwood Productions. There, psychobiologist and body language expert Dr Harry Witchel facilitated three masterclasses about Body Language, Music and Social Territory. These enabled participants to analyze the effects of soundscapes on the body language and behavior of people in general, as well as those filmed during White Night.

### **3.2.3 Control group and live event parameters**

Six weeks prior to the live event, on 17 September 2011, film video and audio footage was taken of the area on a Saturday night from 10:00pm until 12:00am. During the live event, on a Saturday, 29<sup>th</sup> October 2011, the film video and audio footage was taken from 9:00pm until 2:00am. Live analysis of body language behavior was conducted during the pilot (live) event from 11:00pm until 12:00am. Post event analysis of body language behavior was conducted from film footage comparing the control group to the pilot event for the hours of 10:00pm to 12:00am.

Weather conditions during both the control group and live event filming were cold, windy and mainly dry with winds increasing later during each evening. The experiment was not advertised nor signposted so that visitors to the area were not aware of the outdoor soundscape prior to entering. No roadways or venues were closed and all other operations remained as normal. The sound artist curated the sounds live for the duration of the pilot varying the levels and the length of play of the sounds in response to crowd behavior. The artist was situated in an unmarked kiosk off of the road so as not to 'advertise' his presence.

For a fully-immersive 3D soundscape in a public space such as Martyn Ware had previously created in London's Leicester Square and Mexico City, 2 rings of speakers around the perimeter of the space would ideally be used. A low as well as a high ring serving to give a fully realistic sense of spatial directivity to sound sources vertically as well as horizontally. This was not feasible within the physical, health and safety constraints and funding available for the pilot at West Street, which remained open to traffic. Here, the installation consisted of 6 speaker locations at the southern end of West Street immediately north of its junction with South Street. The speakers were arranged in 2 mirrored vertical arrays; 3 on each side of the roadway placed equi-distant from one another. Speakers were mounted at a height of between 2.5 and 3 metres, forming a cube some 16 metres square. This encompassed the main entrances and queuing areas for the large West Street clubs. The speakers were mounted on a mix of scaffolding, steel canopies projecting from building facades, and first floor window openings. Given their location and colour (black) they were not easily noticeable at night. In practice, the canyon form of the street, with continuous multi-storey buildings along each side, gave the introduced sound a highly immersive quality.

## **4 DISCUSSION AND CONCLUSIONS**

### **4.1 Soundscape map of the City of Brighton & Hove**

#### **4.1.1 Discussion**

The current approach to the acoustic environment – based on sound levels and noise mitigation – needs to be complemented with an approach that acknowledges the positive aspects of the acoustic environment. With this pilot study, exploring the possibility to integrate a



soundscape approach with sociotope mapping, we have established that the present method is useful for identifying distinct sociotopes and soundscapes; and have shown that there is a meaningful and statistically significant relationship between them.

The relationship we have found between sociotopes and soundscapes means that people agree to a large extent on the degree to which a specified set of sound sources is appropriate in a place that is suitable for a specified set of social and recreational activities. This clear and meaningful relationship was not necessarily expected. Rather, people could be in disagreement in this respect, which would mean that sociotopes and soundscapes would be uncorrelated. The latter would have meant that all 5 soundscapes would have been appropriate in all 5 sociotopes, and there would have been  $5 \times 5 = 25$  soundscape/sociotope categories. We have found that people typically expect an urban park to have a park soundscape, a beach a beach soundscape, and a city centre a city soundscape, although, of course, there is still room for significant variation and appreciation of local distinctiveness within these general soundscape categories'.

Whereas it could be stated that current noise policy, for assessment, measurement and enforcement purposes, presupposes that acoustic environments are more or less uniform and should not exceed a specified guideline value with regards to sound levels (e.g. 55 dBA; EC, 2002; WHO, 2000)<sup>1,2</sup>, the Sounding Brighton survey results show that soundscapes may – and probably should – vary, depending on what social and recreational activities are deemed suitable for a space by the users of the place. For example, in some places, such as the city centre during the daytime, moderately loud sounds may be acceptable, including road traffic and people noise. In other places, like the city's parks, many people would like to be able to relax at most times of the day; indicating that such a place should be dominated by the sounds of nature but that the sounds of other people may be acceptable when slightly audible. These results indicate that current government and local government policy related to the acoustic environment must be further developed and better adapted to suit human needs.

With regards to urban planning, the method used in the present paper could be used to identify and decide acoustic objectives for an area depending on what social and recreational activities it is intended for. A next step could be to develop soundscape mapping to complement sociotope maps. With regards to the City of Brighton & Hove, the next steps in the development of an applied soundscape strategy would be to identify and map all areas of the city that fall under the five categories of favourite locations, and to decide on their acoustic objectives in line with the five categories of recreational soundscapes. It would then be important to further evidence the research by conducting in situ questionnaire studies with visitors to these areas to further evaluate how the soundscapes of these areas are perceived in reality.

#### **4.1.2 Conclusions**

We found a statistically significant and meaningful relationship between sociotopes and soundscapes. Where soundscape is not taken into account residents may experience loss of health and wellbeing as well as annoyance, particularly in places which would otherwise normally be restorative. Local soundscapes affect the ability of residents to enjoy a place, and consequently local soundscapes affect quality of life. Our results show that it is possible to integrate soundscape with urban planning and design. Sociotope mapping may be expanded to incorporate soundscape, as a tool for soundscape planning. Such a tool would help urban planners to take

soundscape into account at an early stage of the planning process. This would contribute to sustainable urban development, promoting health, well-being and quality of life residents.

## **4.2 Night noise intervention pilot using a soundscape approach**

### **4.2.1 Discussion**

Brighton and Hove City's foresight and commitment show that practical approaches towards better local soundscapes can be explored by engaging audiences in new ways of experiencing the richness and creative power of sound; and demonstrating how it can be viewed as a valuable 'resource' to help mitigate anti-social behavior. During the soundscape intervention experiment audiences on the night were large, positive and curious, engaging with the issues, which was stimulating for the artists. The experiment saw people laughing, hugging and dancing spontaneously; a marked departure from the normal tensions and aggressions the area is known for.

Providing feedback on the event, police commented on how much quieter the West Street area was, so much so that they were confident enough to redeploy police elsewhere in the city. 96% of the audience surveyed felt safe that night as compared to 50% on a usual night. And the Alcohol Programme Board in the city are interested in supporting further work building on the lessons from "West Street Story:Come Together". With continued support from the City Council, police, residents and club owners the work begun during White Night will build on the experiment's findings and trial new ways to address the city's night noise issues.

### **4.2.2 Conclusions**

Overall crowd behaviour observed during the live event and compared with the control group showed that the crowd exhibited happier, friendlier, more open behaviour as well as walking at a slower pace and appearing more relaxed and at ease during prolonged observation periods. Specifically, periods of soft ambient soundscapes, when mid to higher frequency sounds were more perceptible, were associated with calmer, more relaxed crowd behaviour. This also applied to periods when higher frequency sounds such as birdsong and bells were included in the composition. Conversely, a period of more intense, more active music, with distinct tempo, and more energy in the lower sound frequencies (between 2345 and 2400 approximately) was associated with more active and expressive crowd behaviour. Soundscapes dominated by the intermittent roar of heavy surf, with most energy in the mid to low sound frequencies, were subjectively intermediate - neither calming nor arousing in association or effect.

If these initial impressions were supported by more rigorous scientific observations and test conditions, the conclusions would be quite positive for further interventions. If a permanent installation were to be considered, for a place like West Street remaining open to traffic, one option would be to use a larger number of speaker locations to create 3D soundscapes along the footways on each side of the roadway separately to positively impact queues.

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*Table 1. Contingency table for 5 sociotopes and 5 soundscapes*

Sociotope	Soundscape					Totals
	Urban Nature	Distant Nature	Urban	Seaside	Urban Beach	
Beach & Seaside	41 (49.5)	15 (32.7)	31 (31.9)	44 (20.6)	12 (8.3)	143
City Park	46 (40.2)	34 (26.5)	27 (25.9)	4 (16.7)	5 (6.7)	116
Peri-Urban Recreation Area	34 (19.1)	20 (12.6)	1 (12.3)	0 (7.9)	0 (3.2)	55
My Space	7 (13.5)	17 (8.9)	12 (8.7)	2 (5.6)	1 (2.3)	39
Downtown City	4 (9.7)	1 (6.4)	14 (6.2)	5 (4)	4 (1.6)	28
Totals	132	87	85	55	22	381

*Note: Numbers in parenthesis are the values expected by chance.*