Relationship between urban activities and soundscape: commercial areas in Bordeaux and Hanoi

Tuan Anh NGUYEN and Catherine SEMIDOR
GRECAU Bordeaux, École Nationale Supérieure d’Architecture et de paysage de Bordeaux, Talence, France

ABSTRACT: Urban environment has always been linked to cities daily activity. This activity generates specific soundscapes in different areas of the city. It takes place as an everyday urban identity in Hanoi's and Bordeaux's old towns. It features a whole range of different traditional activities. Some of them can be found in Hanoi but not in Bordeaux and vice versa. These activities include circulation, trade, artisan production, services, etc. Soundscape is a good indicator of the urban activity taking place both in Bordeaux's and Hanoi's commercial areas. That is why this paper wants to approach this relationship and to characterize at the same time, the dominant features of their soundscapes.

Keywords: Urban activity, urban environment, soundscape, artisan production.

1. INTRODUCTION

In the urban development process, city centres are always representative areas. They show the dominant features of urban activity and its specific soundscape. The study of urban features is approached by many methods and acoustics is one of them. The research on the soundscape of the commercial areas in Bordeaux and in Hanoi does not relate to a simple comparison of their sound and urban environments, but to the way in which the evolution of their soundscape makes possible to characterise their urban identity. Results obtained from the analysis of their dominant features through photographs and binaural recordings are the basis to assess the quality of urban comfort. At the same time, we propose policies to preserve the cities´ traditional values.

In this paper, we chose to study Bordeaux's and Hanoi's most representative commercial areas. These are Saint-Michel quarter and the old town respectively. Hanoi's old town dominant features are its noisy soundscape and the lively urban activities taking place there.[1]

The recording method we used for the study is called the “soundwalk” and the obtained results “acoustic images”. A key shows the colour corresponding to each Leq (equivalent sound level) band. This bands go from 0 to 90dB in 10dB steps. The equipment used for the study was the following: Digital Audio Tape Recorders, microphone calibrators, Sennheiser microphones and the Symphonie card. [2]

Figure 1: Equipment used, an acoustic image, and its key explaining the colours corresponding to the different equivalent sound level range in dB

2. THE CASE OF SAINT-MICHEL'S QUARTER IN BORDEAUX

2.1 Urban activity features

Saint Michel quarter in Bordeaux is a key place in the city's history. The studied area in this quarter
constitutes its living centre. Besides, it has become its most representative area both in terms of architectural heritage and urban environment. Moreover the square, the quarter is set around, offers to its inhabitants a big breathing space. The reason is its dimensions amongst the city's dense urban fabric compared to other big open spaces around the quarter as circulation junctions with a high density of transportation means.

The urban activities taking place in the area under study are: vehicle circulation, trade (flea markets and some other outdoor markets), bars, restaurants and some small food shops. These activities look like economic organisation of a village especially observing the way they address the quarter's inhabitants setting the typical pace of a traditional market. The markets activity is quite intense during the week and becomes heavier the weekends. Every Saturday, a food and clothes market hosts several hundreds of ambulant merchants and every Sunday, a small flea market takes place in the square. [3]

2.2 Soundscape features

The most representative soundscapes can be found from the morning till three in the afternoon and they consist of engines and exhausts noises, human voices and bells that ring every hour. These sounds create a multiform soundscape. Both the soundscapes of a city and of the countryside can be found in the area under study. Saint Michel quarter is the point of convergence of various axis, each of them having its own character: traditional trade towards le Marché des Capucins, Mediterranean environment in Rue des Faures, flea market stalls in the Church Square, off-licences around Meynard Square... Within the framework of this paper, we chose Rue des Faures for the study, since it has a characteristic soundscape. It combines the traffic noise and the outdoors commercial activities. The soundwalk starts in Cours Victo-Hugo and heads towards Quai des Salinières going across Meynard square. [3]

From Monday to Friday, vehicle and people circulation decreases strongly in comparison to the weekends. There are not many people either in the street or in Meynard square. Not very many commercial activities take place either. This is due to the lack of customers and therefore of sales around this area. That is why the noise level is weak. (Fig 4)

However, during the weekend, circulation increases due to the amount of people that gather in Rue des Faures and especially in Saint-Michel square. The noise increases clearly. (Fig 5)
2.3 Sound recordings results

In order to study the relationship between the soundscape and the urban activities taking place in this area, we did two soundwalks in Rue des Faures. The first was done on a Tuesday at 12h30 (soundwalk one) and the second on a Saturday at 11h30 (soundwalk two).

This two soundwalks had identical characteristics. The principal sound source was the circulation in Rue des Faures. It was located on the left hand side of the soundwalker as he followed his way. The result of the analysis was obtained from the acoustic images below.

On the acoustic images, we can see that the spectral distribution is not uniform. It depends on the cars flow frequency in the street. We can spot a noise level higher than 70dB which corresponds to the cars exhausts’ noise characterised by a distribution of energy over the low frequencies. This is why we can hear a bass sound (of 20Hz). At the same time, this noise generates a masking effect over the other sounds. The sound level of 50-60dB is located over the 20Hz-5kHz frequency band. This shows that the urban activity is stable.

In the “a” zone of the acoustic image, we can remark a noise level difference between both ears; this is due to the urban form change. The right ear faces an open space. That is why the urban activity effect on this ear is weak. The sound field here is well defined, so the right ear receives a lower noise level than the left one. Moreover, we can observe in the “b” zone on the acoustic image that the noise levels higher than 70dB appear quite often. They correspond to a pneumatic hammer in Quai des Salinières. (Fig 6)

On these acoustic images, we can see that the sound spectrum is denser and that the noise level is the same for both ears throughout the frequency band under study. A similar spectral distribution is found along Rue des Faures and in the open space (Meynard Square). This reveals that Meynard Square commercial activity noise is quite high (“c” zone).

However, there is no commercial activity in Durburg square (“d” zone is a car park). That is why the noise level is low. As we could see on the first soundwalk acoustic image, the 70-80dB noise level over the low frequencies represents the cars exhausts noise. Also, the area representing the 50-60dB sound level is bigger on the right ear acoustic image than on the left ear one. The right ear also perceives the noise of the commercial activity. Thus, the effect of the urban activities on the soundscape is rather clear. (Fig 7)

3. CASE STUDY IN HANOI’S OLD TOWN

3.1 Urban environment features

As Saint Michel quarter in Bordeaux, Hanoi’s old town is a particular area of the city. It dates from the seventeenth century. Each street hosts a traditional trading fashion or a particular product sale. That is why the street name is related either to the trading fashion it hosts or to the kind of product sold there. For example: HANG DUONG street (sale of sugar), HANG CAN street (sale of the balance), HANG MUOI street (sale of salt), HANG DONG street (manufacture of objects of bronze, iron), HANG THIEC street (manufacture of objects of tin, sheet)… (Fig 8)

Thirty six streets constituted this quarter originally and that is why it is called “the thirty six streets of Hanoi’s old town” even though nowadays it includes up to seventy six. There are three active markets in this area: DONG XUAN, HANG DA and HANG BE market. Amongst them, DONG XUAN market is one of the largest markets of Hanoi. Its lively commercial activities take place throughout the day and it is open until two in the morning. [4](Fig 9)
3.2 Soundscape features

The old town has become a big commercial centre. There are many people in the street and it hosts a high density of transportation means like buses, cars, motorbikes, bicycles etc. These mixture creates a dense and unstable flow. The noises we can hear there come mainly from engines, cars horns, motor horns and voices throughout the day.

Another Hanoi’s old town commercial activity feature is related to the outdoors stalls found located the streets. The streets actually become real outdoors markets on bank holiday days. (10-HANG LUOC Street)

3.3 Sound recordings results

Within the framework of this paper, we chose two dominant urban activities in Hanoi’s old town, which are production-trade in HANG THIEC street and outdoors commerce in DONG XUAN market. We did two soundwalks on these sites. Both on the same Saturday. The first took place in HANG THIEC street at 15h00 (a return soundwalk) and the second around market DONG XUAN at 16h30 (second soundwalk).

The results obtained from the analysis of these acoustic images are explained below.
We can notice obvious soundscape changes on these acoustic images in comparison to the previously analysed ones. 60-70dB sound levels are also distributed in a dense and identical way on both ears. These levels are present throughout the soundwalk and distributed over frequency up to 5KHz. This shows that the noise generating this levels was not multisource. The principal sources are mainly the human voices and motorbikes engines sounds in a smaller proportion. In fact, this area is an outdoors market and therefore transportation means density is not very high because there are many people in the street. However, we can observe that motorbikes horns impact is quite remarkable. 70-80dB levels on the acoustic images “c” and “d” zones are related to these sound sources.

Through the acoustic images studied above, we can remark that urban activities have great influences on soundscape. These influences are clearly shown by high noise levels distributed over almost every frequency band. They concentrate every sound source in the studied area and the main noise level related to them goes up to 50-70dB.

In Bordeaux, we can observe that the highest noise levels (more than 70dB) come from cars engines and exhausts. This sounds are distributed over the low frequencies (20Hz). However, these noise levels appear on higher frequencies (63Hz) in Hanoi, due to the influence of motorbikes engines and exhausts. These levels also appear around 3,15 KHz due to specific production activities and motorbikes’ and cars’ horns. These are the most important differences between the two commercial areas of both cities.

4. CONCLUSION

In conclusion, the soundscape is a particular field studied in the city. The traditional commercial areas in Bordeaux and Hanoi are places which represent specific characteristics of urban activities. They clearly express everyday life’s rhythm and breathing.

The research on the relationship between soundscape and urban activities is the characterisation of the dominant urban features. This contributes to intensify the knowledge of the urban activities in Western and Eastern cities.

ACKNOWLEDGEMENT

The authors want to thank Ivan Ricoy, sound engineer, for his help during his training course at GRECAU.

REFERENCES