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THE DAY 'IN THE CITY WITHOUT MY CAR': EFFECTS ON URBAN NOISE

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ABSTRACT

Since 1998, the French Ministry of Environment organises an annual day "In the city without my car?". This day is aimed to encourage citizens to travel in the city without their car and to use transport means which are more respectful of the environment. It is a unique opportunity to carry out noise assessment in order to test the potentialities of noise reduction by actions on the traffic in urban areas. This article presents the results of the noise assessment carried out in 1998 and 1999. It shows that the reduction of noise is very dependent on the type of street and of the presence of public transport means. The subject of "urban background noise" and of the changes in the acoustical is also addressed, and it shows that some unpleasant sounds often emerge, and that it could be necessary to think about those sources.

1 - INTRODUCTION

Since 1998, the French Ministry of Environment organises an annual day "In the city without my car?". This day is aimed to encourage citizens to travel in the city without their car and to use transport means which are more respectful of the environment, such as public transports, electric cars, bicycles or walking. The participating cities are all volunteers. Each city defines an area, generally in the centre, where all vehicles are forbidden ("prohibited area"), and another area where only public transports and environment-friendly vehicles are allowed ("restricted area").

In 1998, 34 French cities participated to this operation, 66 in 1999 plus 93 Italian cities. Many cities took this opportunity to carry out acoustical assessment.

2 - AIM AND CONTENT OF THE STUDY

The ban of individual vehicles from the centre of a city is a unique opportunity to carry out investigations on noise, such as:

- the noise reduction potentiality when acting on traffic management
- the urban "background noise" due to the different human activities in the absence of road traffic
- the modifications of the acoustical atmosphere
- the effects of the noise due to public transports
- the citizens response,
- etc.

Noise assessment studies have been carried out in 24 cities and represents about 110 reception points. The measurements have been carried out during the "without car" day and on another similar day, one week before or after.

In most cases, the LAeq noise level has been measured, along with statistical levels such as L95, L10 or L1. The height of the microphone is mainly 5 m, and sometimes 3 or 4 m.

In some cases, the time variation of noise is available.

3 - EFFECTS ON NOISE LEVELS

Considering all the different cities, the mean noise level reduction during the "without car" day is 6 dB(A) (Fig. 1). The highest noise level decrease is 14 dB(A), and, in some rare cases, a slight increase has been measured (+ 2 dB(A)) due to the various street activities put in place during the "without car" day.

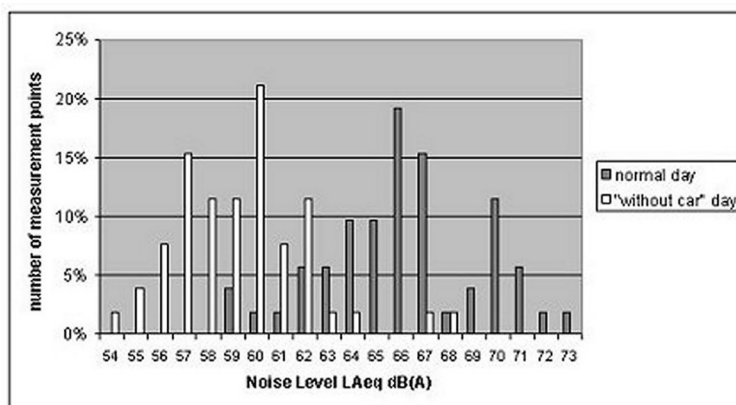


Figure 1: Statistical evolution of noise levels during the "without car" day and a normal day.

The analysis of the measurements shows that the spread of the noise levels reductions between a normal day and the "without car" day is very wide. So two parameters have been considered:

- the type of the street: canyon street or open site;
- the presence of public transports.

As a global analysis, it appears that more the noise level is initially high and more the noise reduction during the "without car" day is significant. This is particularly clear for canyon streets with no public transports. This results shows that the road traffic noise is always the main source in noisy streets.

In canyon streets with no public transports, the noise reductions are the more significant (the mean value is -8 dB(A)), and the spread of the noise levels during the "without car" day is narrow (between 54 and 61 dB(A)): those levels represents the "urban background noise" when there is no road traffic.

We can notice that, considering all the measurement points, the lowest noise level measured during the "without car" day is 53 dB(A). This value could be considered as a floor value for this "urban background noise".

On the other hand, in canyon streets with public transports traffic the noise levels reductions during the "without car" day are lower (the mean value is -3 dB(A)), and the noise levels are still high (between 59 and 70 dB(A)): in this type of street, the noise due to public transports can become predominant very fast. This has been pointed out by some passers-by complaining that the noise from the buses still remains.

In open sites, the mean noise level reduction is 6 dB(A), and the spread is wide. May be one reason is that the noise coming from the other roads is still perceptible in this kind of permeable urban fabric.

4 - EFFECTS ON THE ACOUSTICAL ATMOSPHERE

The analysis of the time variation of noise (LAeq 1s) shows important changes in the curves (Fig. 3): during a normal day, the noise levels are very variable and there is no place for the emergence of other sounds than the road traffic noise. During the "without car" day, the curves show a relatively stable background noise (about 45-50 dB(A)) with numerous other sounds emerging, due to the street activities. Within those emerging sounds, the noise from delivery vans (which often stays engine on), waste disposal trucks, street cleaning vans and even buses becomes very audible and present while it is ordinary covered by road traffic noise. Those noise sources are considered as unpleasant and damage the relative quiet atmosphere during the day without cars.

5 - GENERAL PUBLIC RESPONSE

Passers-by have, in their large majority, spontaneously cited the changes in the acoustical atmosphere: "it is like in a holiday city where we can take time", "it is like if we where in weekend". In the survey carried out in 1999, the replies "quieter" and "less noisy" came first, cited by 45% of the passers-by.

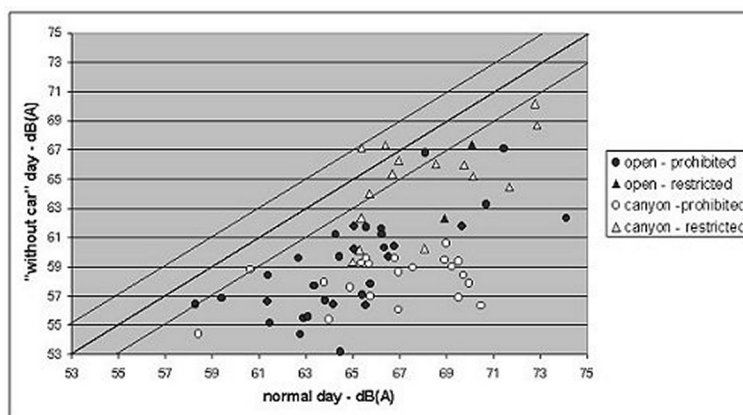
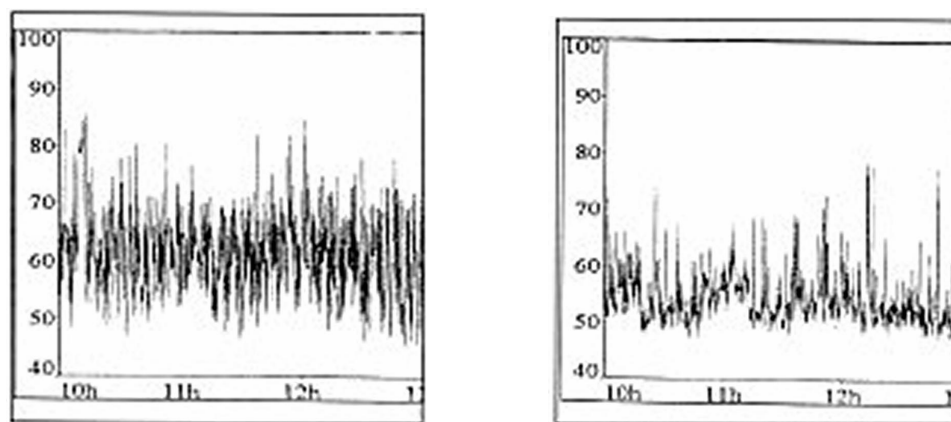


Figure 2: Noise level variation in function of the type of street and the presence of public transports.



(a): During a normal day.

(b): During the "without car" day.

Figure 3: Compared time variation of noise (CETE du Sud-Ouest).

The sounds become identifiable, they have a meaning again. Usually, they are smoothed, they disappear in the road traffic noise.

During the "without car" day, the noise level is the most often less than 60 dB(A), which allows a conversation with normal voice at a distance of 1 m. The oral communication is not disturbed and the attention to other people is increased: "it is possible to talk to each other in a low voice".

It is important to notice that only passers-by and shopkeepers have been questioned. For the residents, we can think about what could be their long term perception of an acoustical atmosphere which is now made up of sound events compared to a higher noise level but more stable and smoothing emerging sounds?

6 - CONCLUSIONS

The noise reduction during the "without car" day is often not as important as it could be expected; this reduction is limited either by the "urban background noise" due to normal human activities, by the emerging noise due to specific street activities, by the noise from public transports means. The changes in the acoustical atmosphere have to be studied in more detail: if passers-by and shopkeepers have a very positive response to these changes, what could be perception of the residents?

Those studies shows that we have to perfect measurement protocols for assessing the effect on noise of such an operation. In 2000, where this day should be European, assessments will be carried in France on less cities, but with a more ambitious and detailed protocol.

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REFERENCES

1. **Soulage**, Ville sans ma voiture, *EchoBruit*, Vol. 89, 1999
2. **Acouphen**, *Evaluation acoustique de la journée "en ville sans ma voiture?"*, rapport pour Acoucité et le Ministère de l'aménagement du territoire et de l'environnement, report n °10074, 1999
3. **CERTU/CETE/MATE**, *En ville sans ma voiture - Evaluation de la journée du 22 septembre 1998 - Méthodes et résultats*, report, 1999