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STUDY OF NOISE POLLUTION IN THE BISTRITA MUNICIPALITY

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Abstract: The paper presents a study about the noise pollution in the Bistrita municipality, taking into account the sound measurement made in the Bistrita city. This paper wants to be a signal that the pollution needs to diminish any ware there are the people subjected to noise pollution.
Key words: *noise, measurements, noise pollution limit.*

1. INTRODUCTION

Movement of vehicles in the cities has led to continued growth in the noise levels, a fact demonstrated by statistical data. They show that about 65% of a population is exposed to a noise level unacceptable. The noise can cause disturbances of sleep and affects capacity of learning, motivation, and problem solving.

Decision monitoring the noise levels on the artery circulation inside the municipality, particularly on the street Andrei Mureşanu and the avenue Decebal was taken as a result of the analysis data obtained from the Environmental Protection Agency Bistrița Năsăud, with the results of the measurements in the last few years carried out both in Bistrița municipality and in the major cities in county Bistrița Năsăud.

It was in view of the fact that: Bistrița in the municipality transit of tourisms is to take place in particular to the internal network in the area historic city, and the little streets make traffic in one direction only, with the result that avenues Republic and Decebal to ensure fall dejectedly to his local traffic and for the long-distance. All of these weaknesses there is the added job shortage park and excess of circulation in lights intersections, in trade centers, educational establishments in the vicinity, station, etc.

The industry, transport (road, airlines and shipyards), agriculture and intensive farming and even living in urban agglomerations are strong potential sources and current of pollution, when framing their general environmental in the circuit is not well adapted. The man should be able to understand better the nature of all the links between all the factors and to insert, in this complex of structures and phenomena are objective, as well as the addition of its social using, but, in accordance with a pre-existing corneal injury should be law.

2. NOISE POLLUTION

The noise - the product of human activity - this is a more important source of noise pollution than can direct effect the audio messages. It must, however, to remember that audible, which exceed the useful of transmission, are transformed into noise annoying.

The noise in urban agglomerations is a worldwide problem seriously and in a continued growth, which has effects on population.

In urban agglomerations shall be established allowable limits for:

- The noise level outside on the streets and passageways underground road;
- The noise level at the limited functional areas in urban field;
- The noise level in functional within the zones in urban areas;

- Indices for the isolation of noise by air for windows and doors in the front panel that delimit different functional units (situated in buildings located on thoroughfares with traffic) [STAS 88].

Allowable values in the level of exterior noise on the streets, measured at the board of the walkway the carriageway, shall be determined according to the technical street category (respectively of traffic intensity) as in table 1.

Table 1.

Exterior noise levels encountered in depending on the technical street category [STAS 88]

No. crt.	Technical street category (conform STAS 10144/1 - 80)	Equivalent Noise Level Lech *) dB(A)	Value of Noise Curve, Cz, dB **)	Pick Noise Level, L10, dB (A)
1	Technical street category IV, local catering	60	55	70
2	Technical street category III, collection	65	60	75
3	Technical street category II, linkage	70	60	80
4	Technical street category I, highway	75...85 ***)	70...80 ***)	85...95 ***)

The equivalent noise level, **Lech**, it is a standardized form of an average noise level in the long term. This concept is extremely useful in situations typical industrial noise, which fluctuates much and contains different periods of intense noise or less intense.

Noise Curve **Cz** represents maximum limits on the levels of noise for a specific frequency according to the destination space.

The level of noise the top **L10** can be considered practically maximum level of the noise.

Of the noise sources in the city we will take as a study modern road traffic, which is increasing. Although engines of motor vehicles are quieter than in the past, the noise on the streets and in particular on motorways is increasing not only to the increase in traffic, but also the speed motor vehicles.

Indeed, at high speeds, the noise can originate in the vibration housing vehicle subjected to rattle wheels, and the interaction in speed of a mass of air. But more important than generators of the noise is friction tires on asphalt road. On an exam it takes a closer look at it is obvious that this is not only about friction, but also the special effects mechanical and aerodynamic which take birth by the impact tire, in fast rotation, with the surface road. Remember that on some modern high noise level exceeded 80 dB, at peak times of the traffic.

From the beginning, the engines of reactors used in commercial aviation had pull of 4 tons. Now it has turned to pull 20 tonnes on the engine. The power of reaction, a large part in the form of mechanical radiation escapes, namely a quantity proportional to the power of 8-a of output speed jet of gas out of the nozzles [STAS 88].

3. LIMITS ASSESSMENT

Limits evaluation is not something easy to do thanks to where the sound is perceived by the different people. International Standards shows us how to determine and to classify the level of noise, but not how to set limits. They are regulated at national or local taking into account the conditions of living, the climate zone, the architecture buildings, etc. In this respect, in most of the countries have been established general two limits: Limit for protected areas (residential) 50 dB; at the enclosure, industrial areas for recreation, transport by road, rail, and air transport, etc. For each of these activities have been determined individual limits depending on their own specific.

These differentions were not sufficient. A noise that day be achievable in the periods of rest they may become harmful. In this respect limits have been established for different time of day (the hours 6.00 - 22.00) and night (the hours 22.00 - 6.00).

The noise levels limit in the industry is made taking into account the two objectives:

(A) Provides for the protection of the effects of local (avoiding installation professional);

B) The assurance of protection under the effects of general (circumvention of the effect of the shame and the failure of her attention).

It is now practical principle that at different jobs require different limits which is why separate rules have been developed for the noise industrial, urban noise, for the noise in buildings the accommodation and social and administrative and for the noise means of transport.

In the case urban noise allowable limits are differentiated: For the area of living accommodation which includes buildings of living accommodation and features social and cultural, related to the home, such as: Crèches, kindergartens, schools, dispensaries at which threshold level of range is 50dB […].

4. MEASUREMENT AND ANALYSIS OF A NOISE INDICATOR IN THE BISTRIȚA MUNICIPALITY

Measurements in the Bistrița municipality have been carried out using a sound level meter CR: 800A, year of manufacture circulation 2006 and the program Deaf Defier, on artery street Andrei Mureşanu - avenue Decebal, 13 points for the surveillance, the points are shown in figure 1.

Fig. 1. Road map of the area of study in Bistrița municipality with points for the surveillance.

The apparatus for the measurement of noise has been set to determine the level of the sound pressure continuous weighted for intervals of 1 minute. Record values have been carried out in the memory weighting for which have been drawn up tables and have made graphic representations with program Deaf Defier. Sound level measurement was made at accost of the street from a height of 1.5m to the ground.

4.1. Data Download

To data download from the noise level meter must have CR: 800A, PC available a communication port additional 9-pin RS232 and which is not to be used by any other program. Deaf Defier for Windows requires data files which have been downloaded from a noise device CR: 800A on the Cirrus Research plc.

Large amounts of data can be created by the Deaf Defier and should therefore be available sufficient space on the hard drive to store these files.

The meter shall CR: 800A can store different types of acoustic data dependent on the function which has been selected and the options fitted to the appliance, such as filters-octave 1:1 and 1:3 AM. The meter shall CR: 800A meets the requirements of IEC60651:1979 and IEC60804:1985.

4.2. Graphical Representations

In the Figures follow there are presented the number of vehicles that are traveled on the roads and the noise levels in four successive days. Figure 2 contains all the vehicles in the four days, but the Figures 3, 4, 5, and 6 contain only one day.

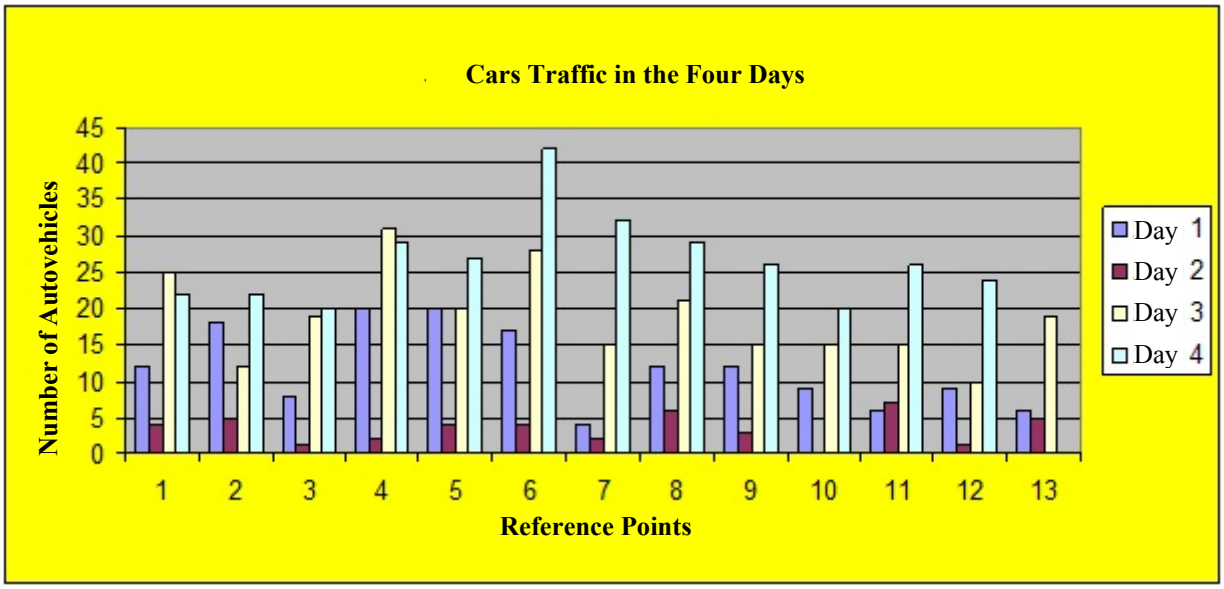

Fig. 2. Cars traffic in the four days.

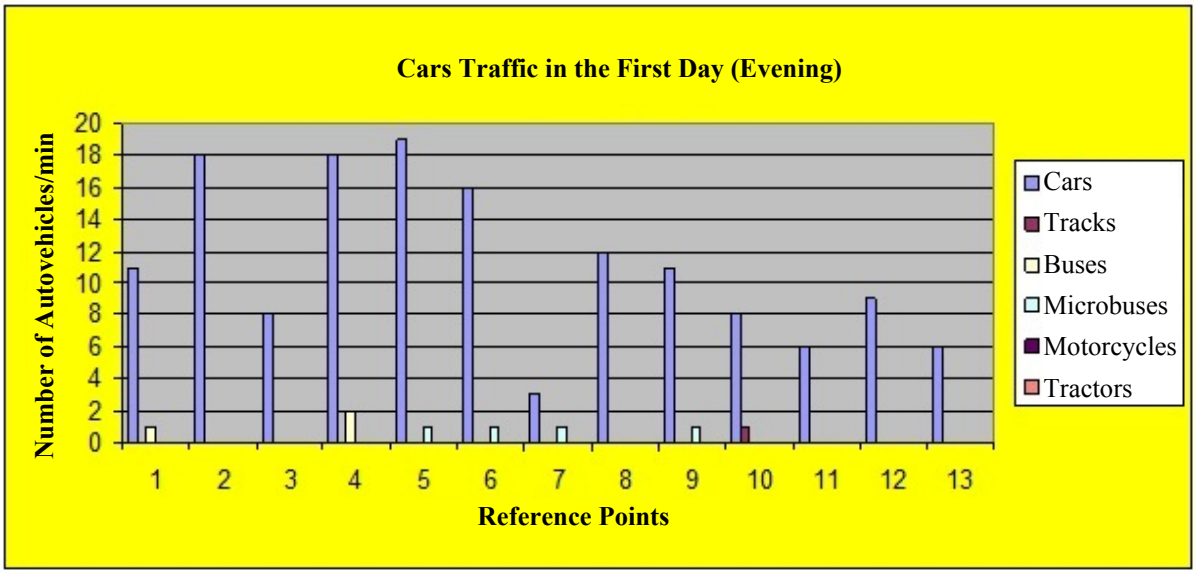

Fig. 3. Cars Traffic in the First Day.

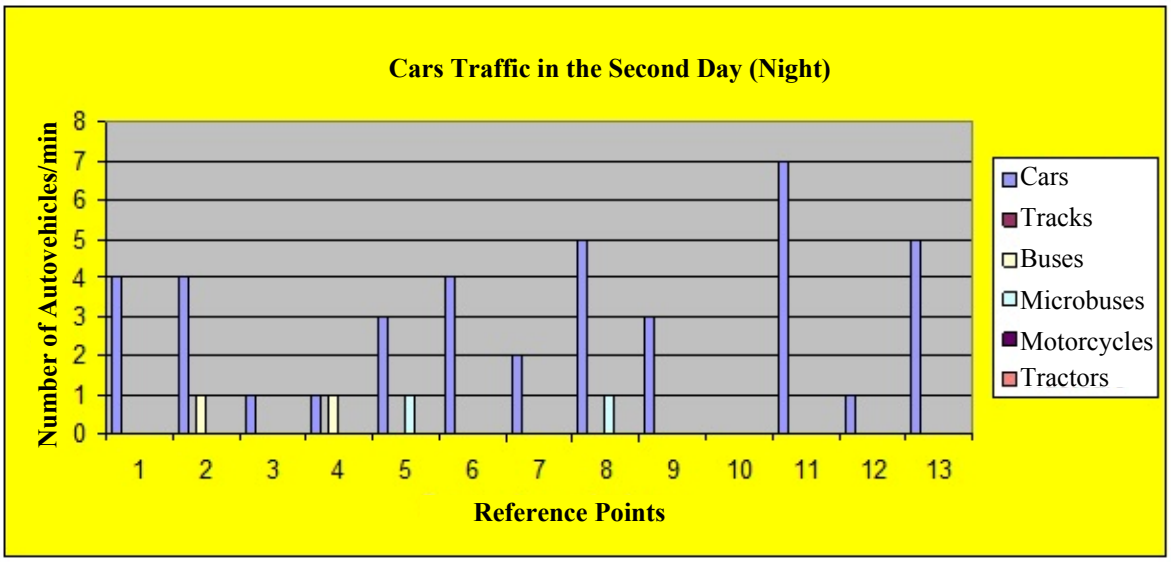

Fig. 4. Cars Traffic in the Second Day.

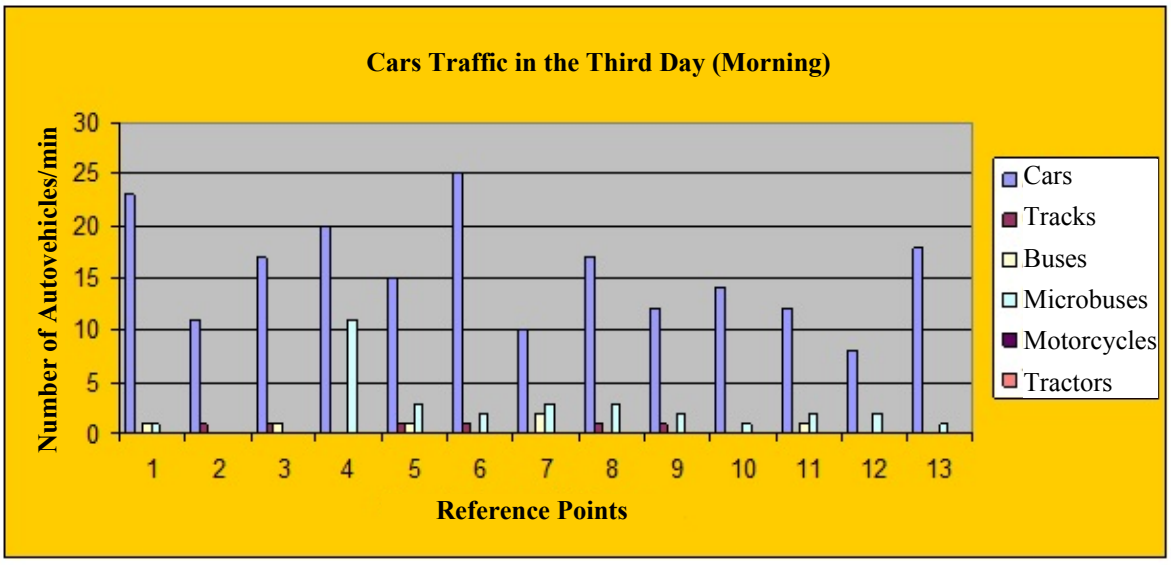

Fig. 5. Cars Traffic in the Third Day.

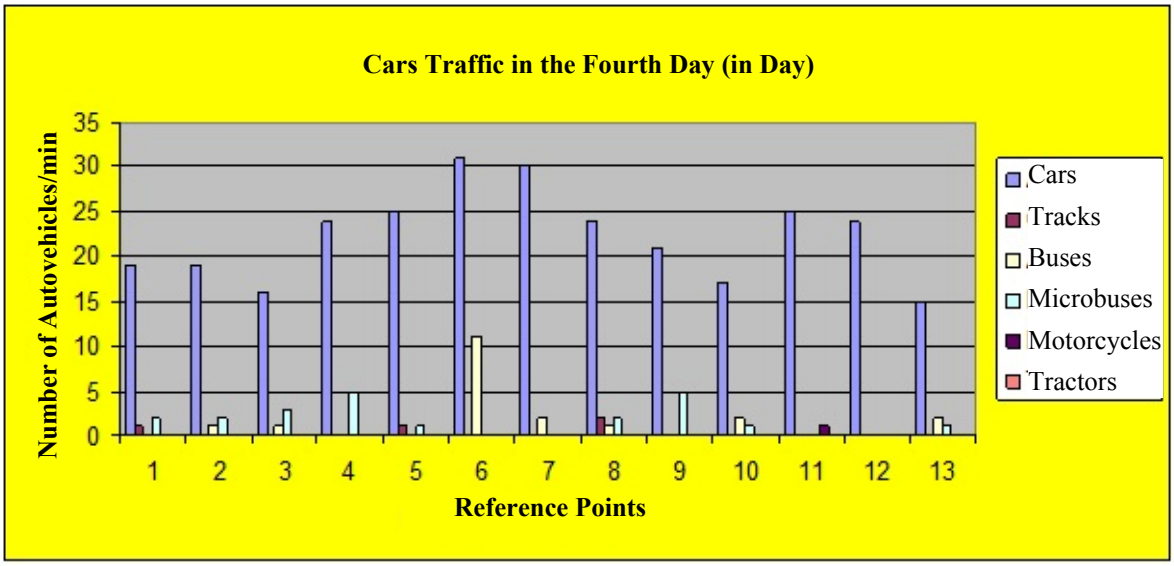

Fig. 6. Cars Traffic in the Fourth Day.

The noise level measurements are given in the figures 7, 8, 9, 10 each figure contains a measurement in a day noted on the figure.

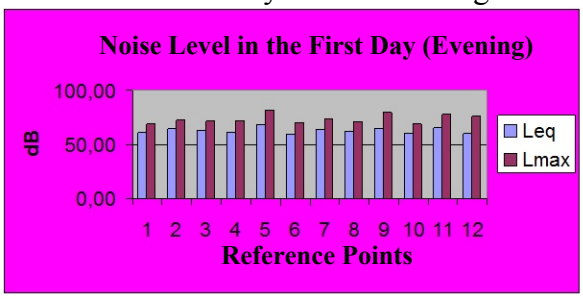

Fig. 7. Noise Level in the First Day

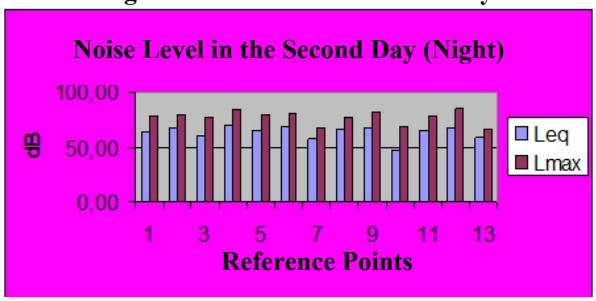

Fig. 8. Noise Level in the Second Day

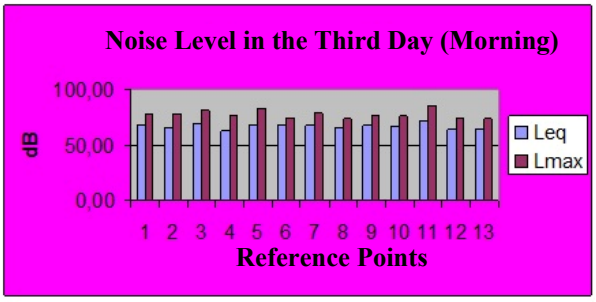

Fig. 9. Noise Level in the Third Day

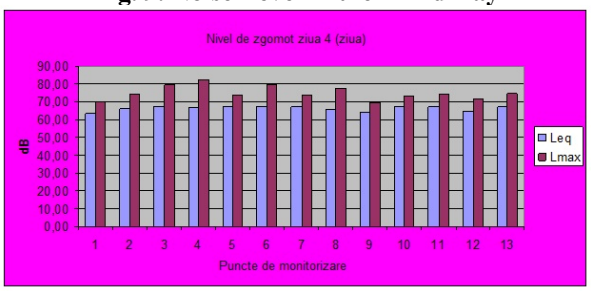

Fig. 10. Noise Level in the Fourth Day

Of research on traffic flows and road effects on the environment has revealed that in the municipality Bistrița urban road transport is the main source of noise pollution to which is added emissions of gases and fine particles, resulting in burning of fuel, which pose a risk for the major health.

From the graphs shown in Figures 7, 8, 9 and 10 it appears that the artery circulation street Andrei Mureşanu – avenue Decebal, the allowable limits of noise during the day are exceeded, and for this reason measures must be taken to reduce pollution.

The comparative analysis of graphs have been carried out, will result in an increase in the level of noise during the day the noise recorded evening and at night, with maximum around hour 16.

With a view to reducing pollution and audible to speed up road traffic on the street Andrei Mureşanu - avenue Decebal, where they have been carried out measurements should be provided for limiting road traffic for the means of transport of cargo, review phases of corner lights rearrangement and even geometry. For the connection to the network current on the rue should be emergence of new passages and bridges over the two obstacles: Railway and the river Bistrița as well as the execution an artery new left circulation on the shore of the river, between the two bridges.

5. Conclusions

REFERENCES

[STAS 80] - STAS 10144/1 – 80 Categorii tehnice de drumuri.

[STAS 88] - STAS 10009-1988 Acustica în constructii. Acustica urbană.Limite admisibile ale nivelului de zgomot.

STUDIU ASUPRA POLUĂRII SONORE IN MUNICIPIUL BISTRIȚA

Rezumat: Lucrarea prezintă un scurt studiu asupra poluării sonore în municipiul Bistrița, luând în considerare măsurătorile efectuate în centrul civic al municipiului. Măsurătorile s-au efectuat în patru zile consecutive, conform standardizării: ziua, seara, noaptea.

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