



Study of the surface traffic inside the Cluj-Napoca urban agglomeration

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The environment protection is one of the most actual problems, because of the fact that the pollution became a major danger for the planet life. The environment pollution is caused because some pollution agents are in a too big quantity and for a long time that they become dangerous for the human health, for the flora, for the fauna and for the constructions too. The pollution sources can be classified in natural and artificial sources. The quality of the environment from a specific area at a certain time can be appreciated by: a) the air quality; b) the water quality; c) the soil quality; d) the health level of the population; e) the deficit of animals and plants species that are accounted for. In the paper there are given the urban traffic on the principal routes inside the Cluj-Napoca municipality. The traffic is the constituent part of the research activity of the national project having the destination the monitoring of the noise and vibrations into an urban agglomeration, applied to the Cluj-Napoca town. This study is the first step for the “noise map” asked for the Romania integration in the European Union for the team researchers of TUCN under the direction of the prof. dr. ing. Mariana ARGHIR.

1 Introduction

The pollution agent which affects the environment quality in an area will receive an accreditation note in accordance with normal limits. The objectives of the ecological impact studies are to give answers and solutions about the influence of the various pollution factors on the environment which results from the infrastructure and the transports in high populated urban zone, industrial installations, etc.

For the environment and inhabitant protection a legislation pack was emitted in Romania and a set of standards which followed UE directives regarding the sound as a main factor of the phonic pollution were enunciated too.

The Directive 2002/49/EEC is the one that settles the main objectives of the environment protection at the phonic pollution. This was adapted at European Parliament Council and the main objective of this is to create a common base for the urban administration of the ambient sound. This directive has the next objectives:

To observe the legislation and the conformation of European request in this field follows to give methods, measure and control techniques of the sounds and vibration pollutions in an urban environment and some instruments from informational and communication technologies field as a decisional support in order that local, regional and national authorities to adopt some measurement that could reduce acoustic pollution in urban agglomeration and some measure to prevent the noxious effect on the human body.

2 Objectives of the national noise study in the urban agglomeration

The rise assimilation level, the application and development of knowledge's, services and the advanced technique in the environment protect field, health of population, information technology on the development and introduction their in Romania of the research competencies and multidisciplinary development in the scope of the technology performances improved, necessary implementation of the national and European normative and to regulate in the pollution control of environment (the sound and vibration pollution).

The proposal problems to be solved:

- The possibility of analyze of representation and monitoring of pollute level of the sound and vibrations in the urban agglomeration;
- The techniques integration of the quantitative and qualitative determination in time and space of the pollution factors of sound and vibration type in the adviser of environment and the impact study about population health;
- The development of the informatics system with high level of data acquisition and processing of data obtained of the directly measurements (the physical dimensions to sound and vibrations, meteorology data, the geographical data) but the evaluation of the propagation of processes that are in the representative differently urban zones – creation of the multi-access base on data;
- The development of the informatics system - the decisional support and the instruction support, they are integration in the national and international net;
- The acquisition of experimental data of urban pilot areas, the access in the informatics systems, the output information generation under the reports form, the noises maps and the useful theses of the impact evaluation about environment and its human health risk about;
- The Romanian research integration in the research circus of the European Union (UE);
- The scientific support creation for the scientific knowledge's elucidation, prove scientifically and profound regarding as pollution propagation like sound and vibration type in the natural environment and the effects about health.

2.1 The measurement objectives

The measurements are made in the Cluj-Napoca town and take into account the following objectives:

- The realization of the real measurements in the representative urban areas;
- The development of the propagation models for the pollutions of sounds type in the urban areas;
- The organization of the pilot laboratory to analyze, the propagation, the attenuation of sound pollution in the urban zones;

- The realization of the pilot system to acquisition, stock and elaboration of the experimental dates of level of representatives urban areas;
- The realization of the adviser system pilot – with the components: decisional support, instruction support (the generation reports of predictive analyze, noise of maps);
- The elaboration of analyze to impact evaluation for the vibrations and sounds in the urban agglomeration about of population health.

3 The Cluj - Napoca surface traffic

3.1 Data acquisition

The start acquisition was made by the specialized office of major house, having the destination the study of the urban traffic for the fluidization of it along the great trajectories of the municipal Cluj-Napoca location.

The initial given data were transformed in a new data having the denominations of them and the traffic for the principal auto vehicles along the road. In the tables the coordinates are the distances regarding the start of the road, and where were the observation points in each rout.

The organized data are given in the tables noted with 1, 2 and 3 numbers, but because the tables are larger as the page columns they are given on the whole page weight at the end of the paper.

3.2 Graphical traffic study

The given data bases were organized into new files for a traffic study along the urban routs for the comparison between the auto vehicles flux inside the town. The tables contain the new structure of the traffic on Cluj-Napoca municipality. The head of each table contain the length along the road and the number of vehicles taking into account them type and traffic. The traffic values concentrated in the 1 – 3 tables have graphical representations for the good interpretations. The figures 1 – 3 contain the graphical representations of the corresponding table.

For each road inside the Cluj-Napoca municipality there is the establish limit of the road capacity. On each figure red line give the limit for the road capacity and some one can observe that there are a lot of roads in which the traffic is greater then the corresponding road capacity. This is a very strong problem in Cluj-Napoca municipality.

4. Conclusions

1. The figure 3 contains the buses vehicles traffic. This is a slow traffic and the number of vehicles is less than the number of another vehicles. The traffic limit is 3000 per a day.

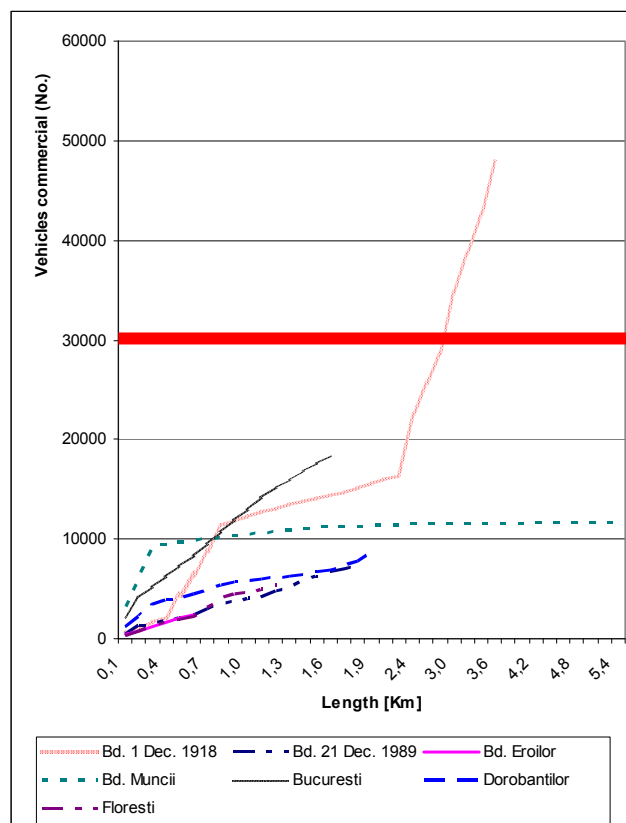


Fig. 1 The commercial vehicles traffic on the Cluj - Napoca roads

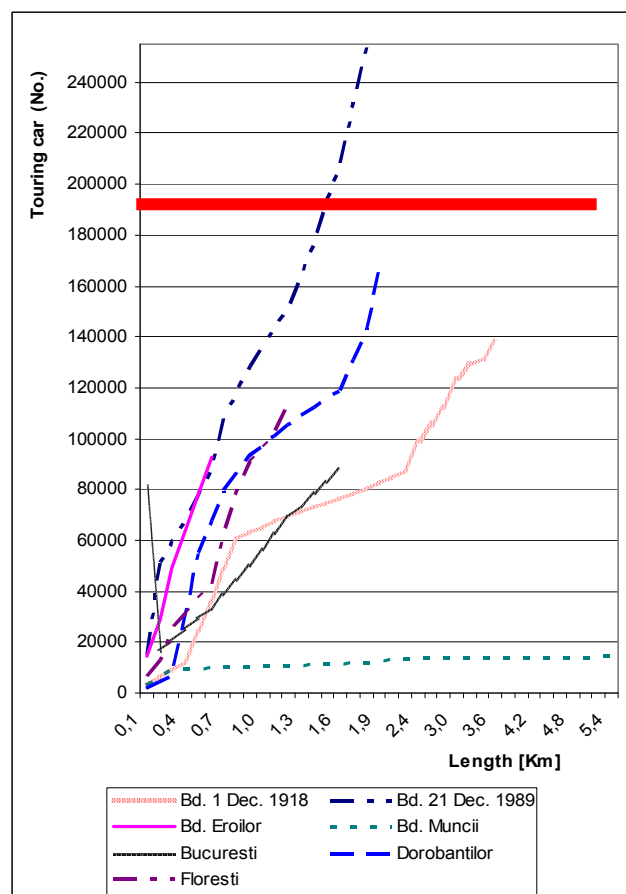


Fig. 2 The cars traffic on the Cluj-Napoca roads

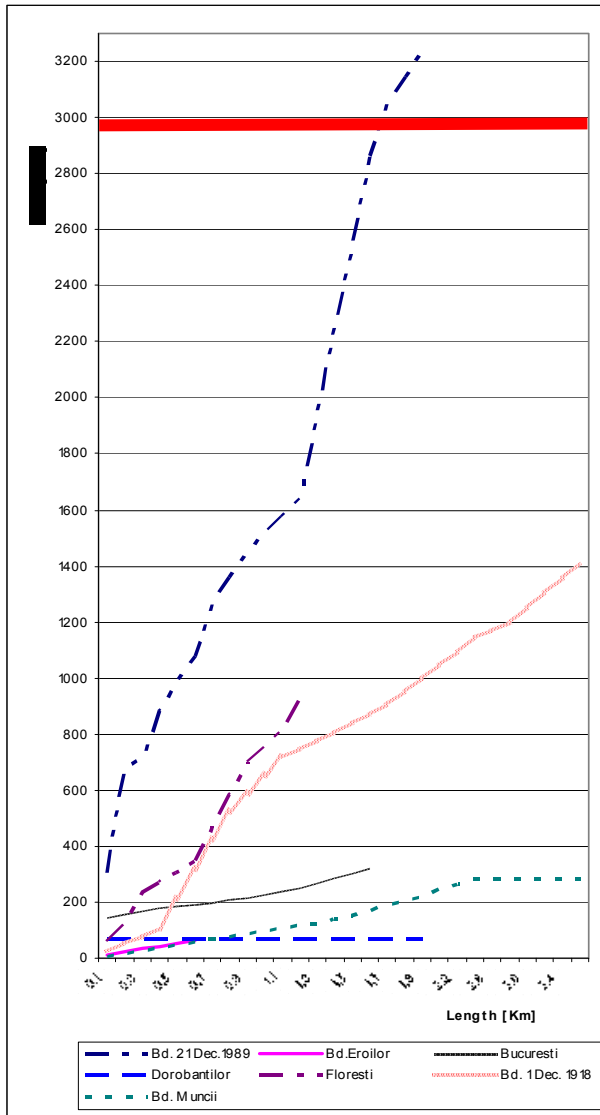


Fig. 3 The buses traffic on the Cluj-Napoca roads

2. The figure 2 has the touring cars traffic and it is a very, very strong traffic on the Cluj-Napoca roads. The traffic limit is 196000 cars per a eight hours, between 8.00 and 16.00 in a day.
3. In the figure 1 the traffic is presented for the travelling (commercial) vehicles, and it is a good traffic and important for the people who are located in this town. The traffic limit is 32000 vehicles per a day.

4. All the vehicles form together a very strong and intensive traffic and they form a flux of vehicles that are greater then the road traffic capacity. In this situation is necessary to reduce the traffic, or to modify (to grow) the roads traffic capacity.
5. The vehicles form a special source of noise and vibrations inside the town, and them pollution influence negatively the people health.
6. This study is the first step for the “noise map” asked for the Romania integration in the European Union and there are many problems to solve for realise a good environment inside the urban agglomeration regarding the traffic noise.
7. The vehicles traffic was realized manual by a group of observers account.

5. References

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Length [Km]	Bd. 1 Dec. 1918	Bd. 21 Dec. 1989	Bd. Eroilor	Bd. Muncii	Bucuresti	Dorobantilor	Floresti
0,1	542	501	403	3116	2033	1150	348
0,2	1084	1345	809	6232	4067	2300	697
0,3	1626	1562	1222	9347	5109	3451	1394
0,4	2167	1779	1628	9499	6151	3906	1687
0,5	4334	2082	2031	9651	7193	4074	1980
0,6	6501	2385	2434	9803	8236	4511	2273
0,7	8717	2991		9955	9437	4949	3152
0,8	11409	3597		10107	10638	5353	4069
0,9	11823	3798		10259	11838	5758	4496
1,0	12237	3999		10411	12920	5897	4709
1,1	12651	4199		10563	14002	6036	4923

1,2	13065	4731		10715	15083	6175	5350
1,3	13396	5263		10867	15894	6315	
1,4	13727	5764		11019	16705	6494	
1,5	14058	6261		11171	17516	6673	
1,6	14389	6695		11212	18328	6851	
1,7	14721	6998		11253		7288	
1,8	15135	7301		11294		7726	
1,9	15549			11335		8601	
2,0	15963			11376			
2,2	16377			11417			
2,4	22467			11458			
2,6	25512			11483			
2,8	28557			11508			
3,0	34647			11533			
3,2	38655			11558			
3,4	42696			11542			
3,6	47881			11556			
3,8				11570			
4,0				11584			
4,2				11598			
4,4				11612			
4,6				11626			
4,8				11647			
5,0				11668			

Table 1 Commercial Vehicles Traffic

Length [Km]	Bd. 1 Dec. 1918	Bd. 21 Dec. 1989	Bd. Eroilor	Bd. Muncii	Bucuresti	Dorobantilor	Floresti
0,1	3006	15230	14412	3157	81512	2125	6227
0,2	6012	51108	29063	6314	16303	4250	12455
0,3	9018	59153	49188	9472	20497	6374	24910
0,4	12026	67199	63839	9619	24691	30878	31011
0,5	23996	77406	78251	9766	28885	55212	37112
0,6	35966	87614	92622	9913	33080	67420	43214
0,7	48401	108029		10060	38645	79629	61518
0,8	60713	118236		10207	44210	86562	79822
0,9	62892	128444		10354	49774	93496	91016
1,0	65071	136156		10501	56097	97363	96613
1,1	67250	143868		10649	62420	101230	102210
1,2	69430	151581		10797	68742	105097	113404
1,3	71173	164776		10945	73484	108963	
1,4	72916	177971		11091	78226	112189	
1,5	74659	193201		11240	82968	115415	
1,6	76402	207945		11595	87710	118642	
1,7	78147	231361		11950		130850	
1,8	80326	253869		12305		143059	
1,9	82505			12660		167476	
2,0	84684			13015			

2,2	86864			13370			
2,4	99113			13725			
2,6	105294			13760			
2,8	111475			13795			
3,0	123837			13865			
3,2	129077			13900			
3,4	131527			13899			
3,6	137667			13934			
3,8				13969			
4,0				14004			
4,2				14039			
4,4				14073			
4,6				14108			

Table 2 Cars Traffic on the Cluj-Napoca Municipality

Length [km]	Bd. 21 Dec.1989	Bd. Eroilor	Bucuresti	Dorobantilor	Floresti	Bd. 1 Dec. 1918	Bd. Muncii
0,1	305	11	140	70	58	26	7
0,2	673	22	152	70	116	52	15
0,3	708	33	164	70	232	79	28
0,4	883	44	175	70	270	105	38
0,5	979	55	182	70	308	210	48
0,6	1072	66	189	70	348	315	58
0,7	1261		196	70	464	420	68
0,8	1356		203	70	580	525	78
0,9	1450		210	70	696	588	89
1,0	1513		221	70	754	651	97
1,1	1576		233	70	812	714	106
1,2	1639		245	70	928	745	117
1,3	1944		262	70		776	126
1,4	2249		279	70		807	142
1,5	2554		297	70		839	154
1,6	2859		315	70		871	172
1,7	3048			70		903	190
1,8	3142			70		950	208
1,9	3237			70		997	226
2,0						1045	244
2,2						1092	262
2,4						1145	280
2,6						1171	280
2,8						1198	280
3,0						1251	280
3,2						1304	280

Table 3 Buses Traffic inside the Cluj - Napoca Roads