



Urban Audio Zaragoza Project
"Convert the ambient noise in relaxing melody"
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European Green Capital Award 2016

6. Quality of the Acoustic Environment



An initiative of the
European Commission

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Spain

6. QUALITY OF THE ACOUSTIC ENVIRONMENT

6A. Present Situation

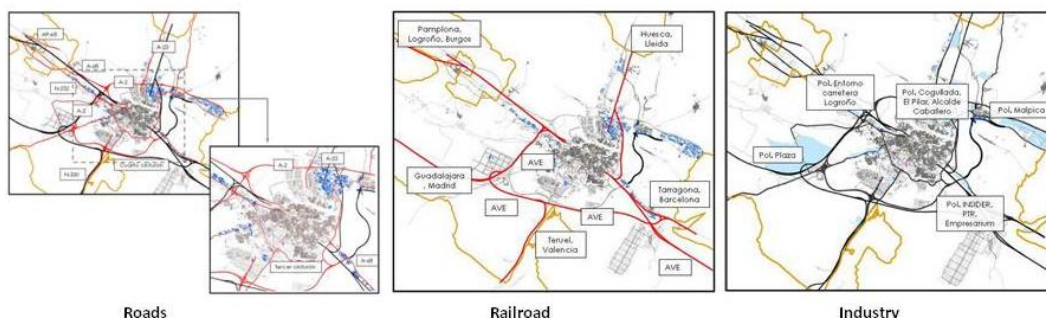
Describe the present situation in relation to the quality of the acoustic environment, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area. Where available, information/data should be provided from previous years (5 – 10) to show trends.

Provide details on:

1. Share of population exposed to noise values of L_{den} (day-evening-night) above 55 dB(A);
2. Share of population exposed to noise values of L_n (night) above 45 dB(A);
3. The percentage of citizens living within 300m of quiet areas.

Zaragoza is a pioneering city in the control and management of environmental noise as it is proved by its Noise Map made between 1990 and 1998, the Survey on the Social Perception of Noise made in 1990, and two Municipal Bylaws on Protection against Noise and Vibrations (1986 and 2001). In 2006/2007 the City also made a Strategic Noise Map, allowing specialists to update diagnosis and implement the Directive 2002/49/EC. (Rule 37/2003 in Spain).

Road traffic is the main source of noise in the index of population exposed to it, affecting most part of the city areas. Nevertheless, the noise produced by industrial activities or the railroad does not affect a big part of the population (*graphic 1*)



Graph 1. Communication roads and industrial

The Municipal Action Plan against Noise 2010-2015 is the tool for managing the acoustic impact:

Correcting Plan: reduce the current acoustic impact

Reduction of the percentage of population living in a home with external noise levels over 65 night dBA

Preventive Plan: avoid the appearance of new impacted facilities

Sound quality and municipal sensitive uses are compulsory in new homes

Preservation Plan: keep acoustically quiet situations

Declaration of five “quiet areas”, with a prevention plan.

The noise levels measured in the external façades of the residential buildings (*graphic 2*) are extracted from the Noise Map.

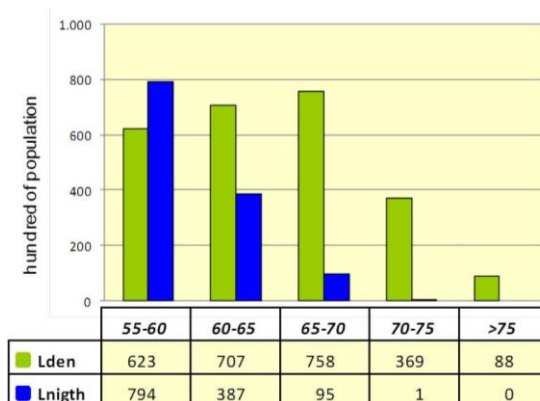
% exposed population	Day >65 dB(A)	Night > 55 dB(A)
Streets	10%	20%
Roads	1%	3%
Railroad	0%	0%
Industry	0%	0%
GLOBAL	16%	21%

Graph 2. Percentage of population exposed to noise levels "Lden" over 55 dB(A)

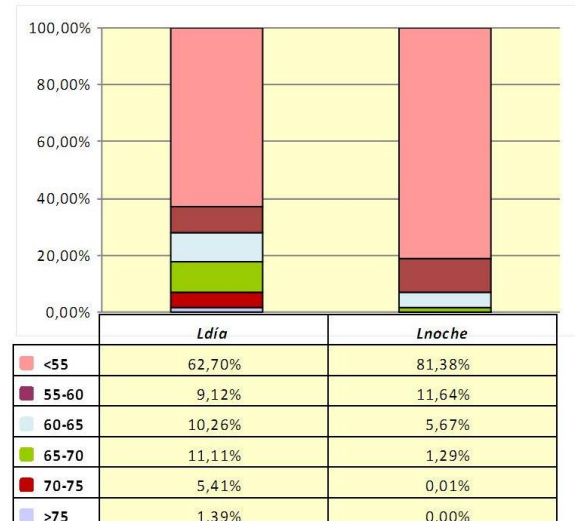
It is a five-year indicator with data from 2007 to be revised not before the public and private transport is regulated and after the tram line is in use in 2013.

The evaluation refers to the population potentially exposed since that indicator represents the sound level existing in the façades of the dwellings.

These levels do not allow us to extrapolate directly those obtained inside the dwellings, since they are conditioned by the quality of its acoustic insulation.



Graph 3. Population exposed to noise (streets)



Graph 4. Percentage of population exposed to noise

The main results extracted from the acoustic quality indicators are:

Municipal areas subjected to the different levels of decibels by every source of environmental noise, considering the contribution of every one of them: 11.3% of the surface over 50 dBA Ln:

- 11,3 % of the city area above 50 dBA Ln.

Population subjected to the different levels of decibels by every source of environmental noise, considering the contribution of every one of them: 21% of the population over 55dBA Ln:

- 21 % of the population above 55 dBA Ln.

Sensitive buildings subjected to levels over quality goals: 24% in streets and 12% in roads:

- 24% relative to streets y 12% relative to roads

Zaragoza has “five quiet” areas” (*graphic. 5*), corresponding to significant places, with the following characteristics:

AREA	Surface m ²	Characteristics	Population less than 300 m away	Excess dBA
Venecia Pine Forest	405 000	Pine forest of natural interest, not for recreational uses, affected by the third ring	No data	5 dBA
José Antonio Labordeta Park. Botanic Garden	440 000	Large green area for recreation and sports	No data	5 dBA
Juslibol Meanders	1 460 000	Green area not affected by noise levels over th	No data	0
Oliver Park	180 000	Urban park surrounded by railway tracks	No data	5 dBA
Mouth of the river Gállego	90 000	Future recreation park	No data	5 dBA



All these measures and actions have benefited from intensive dissemination campaigns, stressing environmental benefits, but also have suffered from a strong social opposition. The car, for some citizens, continues to be a right that cannot be waived even though other sectors support its restriction in the city centre.

Despite all that, the City goes on with its plan for reducing sound levels and CO₂ and for improving air quality

Noise levels have substantially reduced in wide areas of the city but its evaluation has not been made yet.

6B. Past Performance

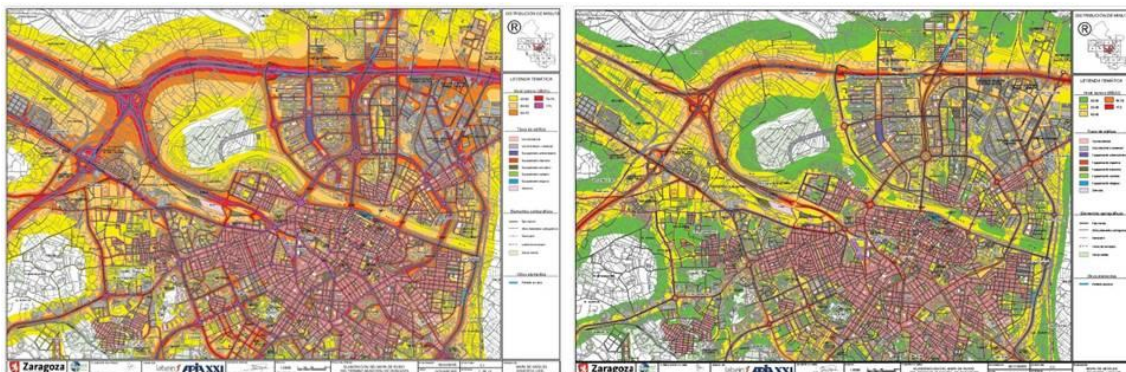
Describe the measures implemented over the last five to ten years for improving the urban sound quality and increasing awareness to noise. Comment on which measures have been most effective.

Make reference to:

1. Classification of territory (if applicable) into appropriate noise classes and with appropriate noise limits (e.g.: specially protected, hospitals/schools, residential, commercial, industrial) including details on enforcement mechanisms if in place;
2. Stakeholder involvement;
3. Communication with citizens;
4. Preservation and improvement of good acoustic urban environments such as quiet areas;
5. Noise reduction measures that influenced the current situation;
6. With respect to the adopted action plans, what is the percentage of the plan effectively implemented (e.g. overall amounts already paid for actions versus overall amounts initially committed).

The Actions Plan against Noise 2010-2015 has been the strategic tool used for the whole work implemented by the City in the last years.

One of the key elements for the management of the acoustic environment of the city is to make a Strategic Noise Map for obtaining a diagnosis and control, and act on the area subject to special protection or on the most sensitive ones. (*graphic 6*)



Graph 6. Affected areas in the city centre. Lden – Ln. Zaragoza Noise Map.

The main measures adopted in compliance with the Plan have been:

Measures for reducing population subjected to night levels over 65 dBA produced by urban traffic noise: Tram Line number 1 -North-South axis- has been finished with a total length of 12.6 Km. From its launching in March 2013, there has been a reduction of traffic of approximately a 50%, and a 40% in urban bus lines.

The areas the new tram cover are now subjected to over 65 night dBA, but currently it is estimated that the noise produced by traffic is less than 50 dBA at night.

Preventive measures: House promoters are required to present an acoustic survey as well as the corresponding correcting measures of planning, regulation of uses, acoustic screens, et al by the Municipality in order to guarantee an acoustic comfort to the residents.

Measures for the reorganization of the traffic of industrial goods: A total detour of truck with industrial goods from SAICA factory at San Juan de la Peña Street has taken place. Now trucks use the road entrance to Cogullada industrial area.

Traffic of goods from SYRAL factory using Salvador Allende Street has also been suppressed.

Measures for reducing the noise produced by infrastructures: Different and important works for the construction of acoustic barriers in places with night level over 65 dBA, as it can be appreciated in the following photo, have been implemented. (graph. 7)



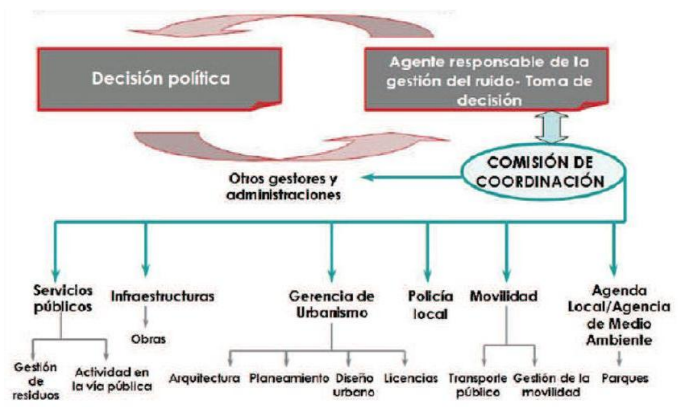
Graphic 7. Acoustic barriers for reducing noise produced by infrastructures

Measures for minimising the acoustic impact produced by works and public services:

In all the specifications for the companies contracted by the City for works in public thoroughfares or for the services of cleaning, waste collection and maintenance of the public transport, is compulsory the enforcement of the Royal Decree 212/2002 linked to the Directive 2002/49/EC..

An important part of these measures and the application of the Action Plan against Noise have been made in cooperation between the City of Zaragoza, the Government of Aragon and the different Ministries competent in every specific field, fundamentally the Ministry of Public Works.

The coordination of the management of the acoustic environment depends on the Agency of Environment and Sustainability of the City of Zaragoza that belongs to the Department of Culture, Education and Environment. (graph 8)



Graph 8. Noise Management Chart. City of Zaragoza

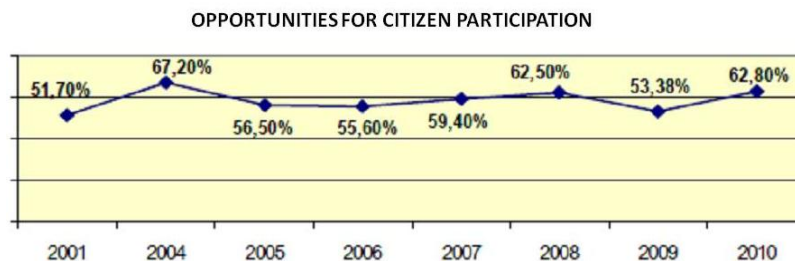
The pack of actions included in the Plan counts with a funding amount of around 900 million euro to be paid by the City, the Central Government and private promoters.

Currently, municipal investment is around 425 million euro plus 200 million euro foreseen for tram Line 2 that is right now in its planning stage.

Lower quantities correspond to correcting measures implemented by private promoters of the new urban developments. The reduction of noise levels in big infrastructures has been done by the Ministry of Public Works.

With respect to the intervention of the citizens in the process for improving the acoustic environment, its participation is not only compulsory by the City but also an evident demand due to the importance that noise has in the quality of people's life. Zaragoza has a strong network of

citizens associations that channel the claims and suggestions of the residents to the Agency. This is a very fluid communication channel that attends the most urgent demands and collects the far-reaching approaches. (graph 9)



Graph 9. Participation of the city in sustainability processes

The biggest satisfaction degree (68.2% corresponds to citizens between 26 and 35 years old.

6C. Future Plans

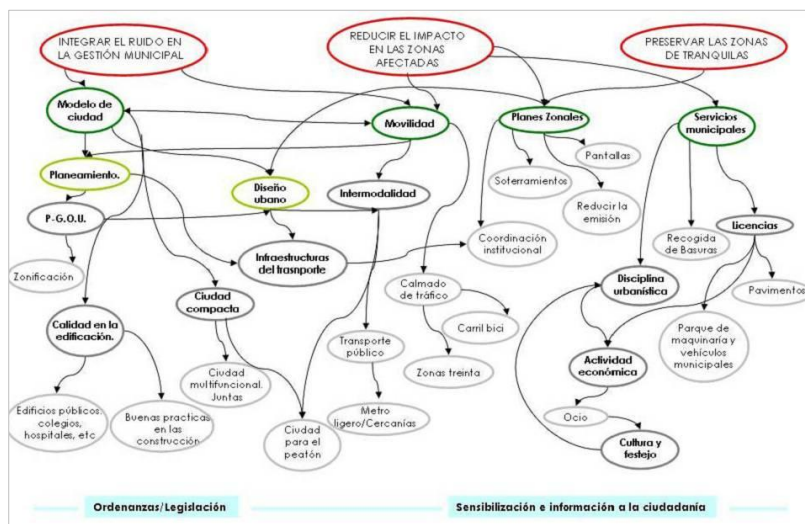
Describe the short and long term objectives for quality of the acoustic environment and the proposed approach for their achievement. Emphasise to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes.

Make reference to:

1. Stakeholder involvement;
2. Consultation with the population including noise perception survey;
3. Actions to reduce the impact of noise from roads, railways, industrial areas and air traffic (Noise plan);
4. Foreseen reduction in the share of population exposed to noise values of Lden (day-evening-night) above 55 dB(A) and in the share of population exposed to noise values of Lnight (night) above 45 dB(A), mention targets;
5. Actions to maintain, extend, or improve urban quiet areas;

Holistic/qualitative approaches to the acoustic environment (e.g.: with soundscapes approaches).

The action plan against noise has still planning until 2015 and corresponds to a long-term vision related Zaragoza strategic plans and sustainable mobility in the city. (graph 10)



Graph 10. Management of the Acoustic Impact. City of Zaragoza

In the present last stage of validity of the Plan and as a previous step for the drawing up of the following one, it is necessary to implement measures and actions able to improve the systems of management of the acoustic environment of the city and insist that legislation must be applied in every source of noise:

- ✓ reduction to a 6% of the city area exposed to noise levels over 50 dBA night
- ✓ reduction to a 10% the population exposed to noise levels over 50dBA night
- ✓ a more precise description of the thoroughfares with less traffic and analysis of noise levels in urban streets with a speed limit under 50 km/h. This will produce indicators' results more precise and foreseeable more reduced
- ✓ execution of a survey on the perception that citizens have on the quality of sound and evaluation of the problems caused but an excess of noise
- ✓ drawing up of specific methods for new residential and industrial developments
- ✓ new Municipal Bylaw foreseen to be passed in 2014, currently being prepared
- ✓ launching of tram line No 2
- ✓ application of pavement with low sound level
- ✓ reduction in the number of urban buses and replacement of the current ones from 2015 with hybrid-buses with low sound level
- ✓ new 30 speed-limit areas and zones for pedestrians and bikers
- ✓ integration of the quality of the acoustic environment within the Sustainable Mobility Plan of the City of Zaragoza
- ✓ establishment of the requirements deriving from the application of the Royal Decree 1367/2007 referring to acoustic zoning, objects of quality and acoustic emissions for the new transport infrastructures and the new residential developments
- ✓ introduction of systems for the monitoring of noise in the Airport of Zaragoza and for knowing noise levels in determined areas of the city. It will be also possible to track the degree of achievement of the timetables and the routes of the commercial flights
- ✓ definition of a specific type of "quiet area" serving as a framework to plan a strategy for the protection of its acoustic environment
- ✓ improvement of the Municipal Legislation on the acoustic environment, more concretely for the sectors of shopping, industry, saturated areas, indoor leisure places and concentration in urban roads of people during playful or leisure moments.

Certainly, the effectiveness of this strategy will also depend on the behaviour of its citizens but the Municipality has imposed to itself a global goal of reducing noise level in 1.3 dBA for the whole of the city.

Due to the works made in the city both for the preparation of EXPO 2008 and for the construction of big infrastructures, the City of Zaragoza requested the European Commission and the Ministry for a provisional postponement in the updating of the supervision of noise levels. It was evident that, during those moments of full working activity the allowed limits would be, without any doubt, overcome.

But right now the big works have finished, the tram is already working and traffic in the city has been reorganised, and it is the moment to make an evaluation and analysis of the effects that the new organization and the noise levels supported by the population have in the city.

6D. References

Reports, Documents, Surveys

- Action Plan of Zaragoza against Noise Z2010-2015
- Strategic Noise Map of Zaragoza
- *The Noise as a Psycho-Sociological Phenomenon and its Perception by the Citizens*. A survey made with the collaboration of the citizens of Zaragoza and the social perception of noise as very important elements
- Sustainability indicators of Zaragoza
<http://www.zaragoza.es/ciudad/medioambiente/agenda21/observatorio/indicadores.htm>
- Plan of Sustainable Mobility
<http://www.zaragoza.es/ciudad/movilidad/>

Legislation

- Law on Noise 37/2003 that transposes the Directive 2002/49
- Royal Decree 1513/2005 on the evaluation and management of noise
- Royal Decree 1367/2007 on acoustic zoning, quality goals and acoustic emissions
- Municipal Bylaw for Protection against Noises and Vibrations in the Municipality of Zaragoza. 2001
- Compulsory signalling for premises with a sound system. 2003,