

Managing Noise in Barcelona

Barcelona City Council



Managing Noise in Barcelona

Overview

1. Historical and geographical context
2. Noise Map
3. Noise limits
4. Measures taken
 - Diagnosis
 - Control and prevention
 - Noise abatement

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Historical and Geographical Context

Acoustic complexity of Barcelona

- Extension: nearly 100 sq.km
- Population: 1.600.000 inhabitants

High demographic density:
15.000 inhabitants/sq. Km



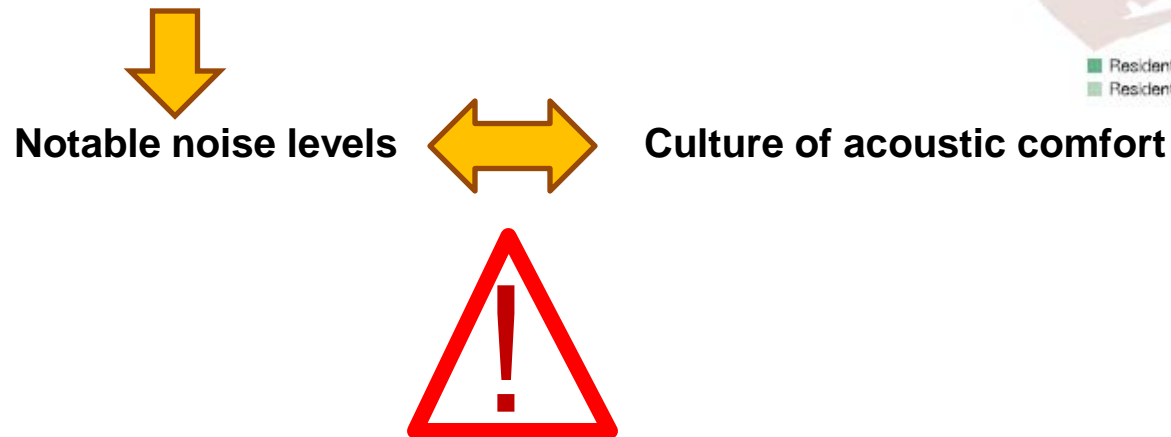
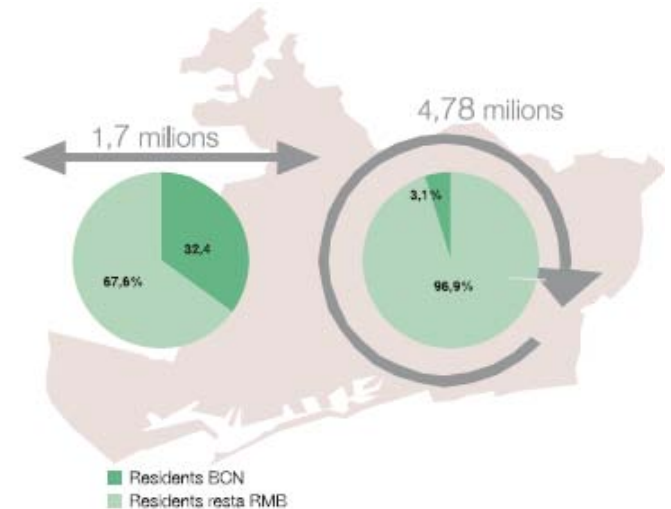
- **Metropolitan dimension:**
3.200 sq. Km
5.000.000 inhabitants
1.500 inhabitants/sq. Km

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Historical and Geographical Context

Acoustic complexity of Barcelona

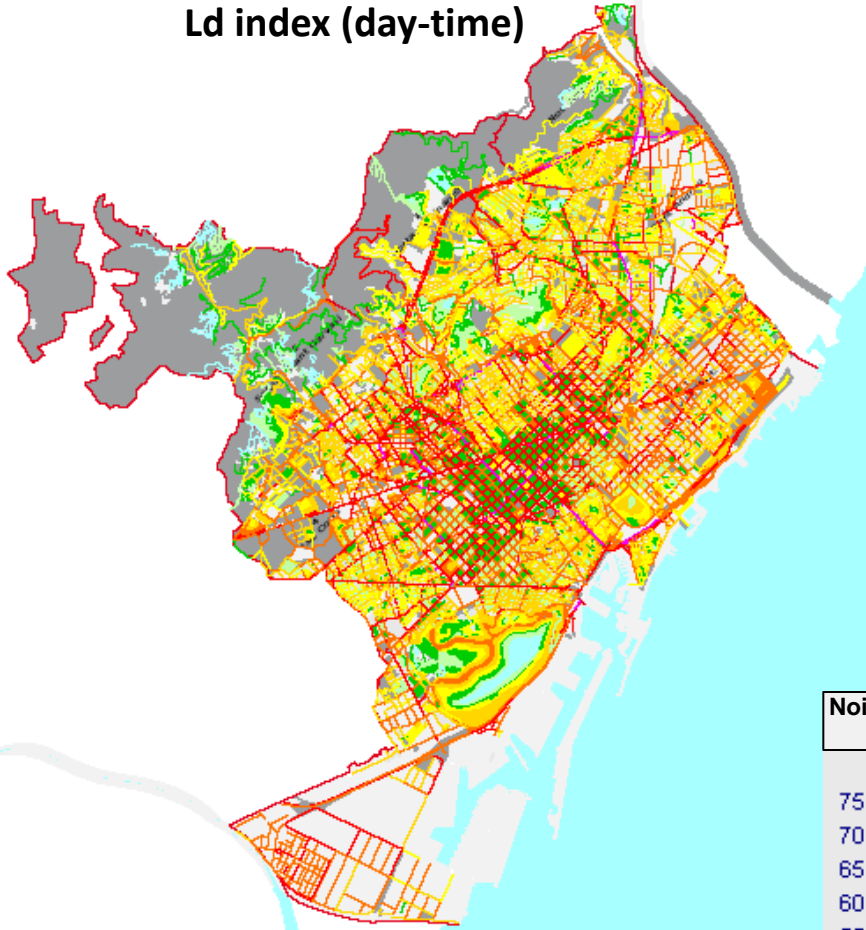
- **Mobility:** high level of traffic
- Major European **tourist destination**
- Increasing number of **immigrants**
- Mild **Climate**
- Wide **offer** of commercial, cultural and leisure activities
- City's busy **nightlife:** coexistence of uses



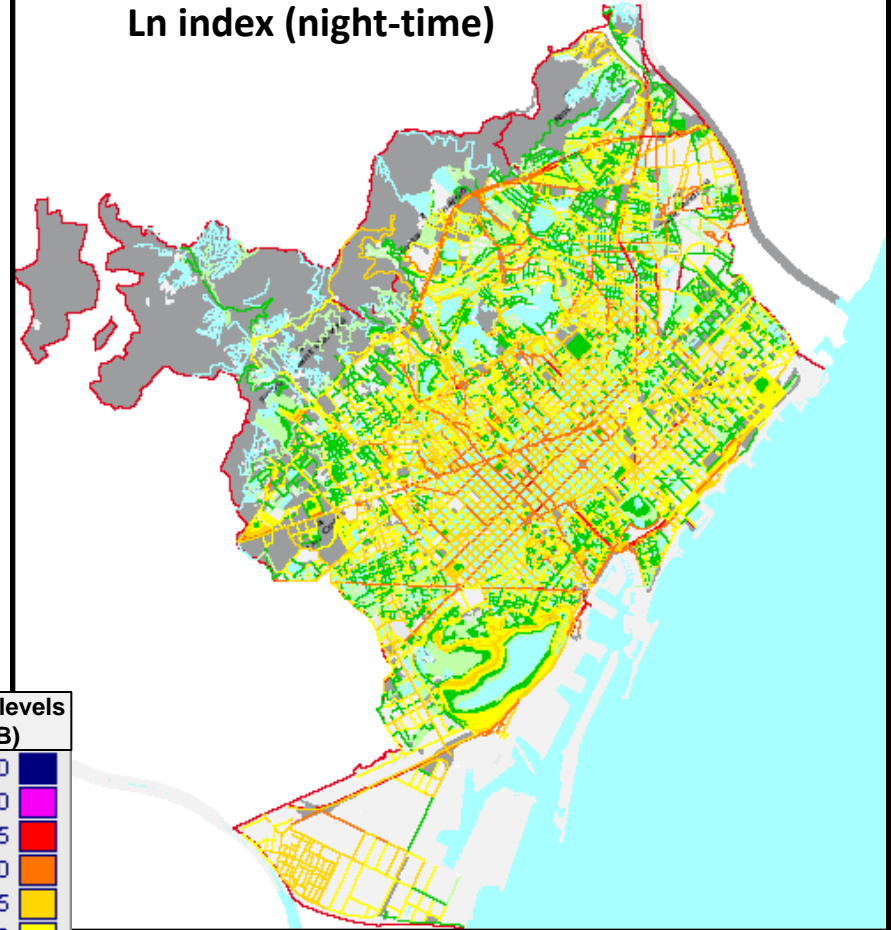
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Noise Map (2009)

Ld index (day-time)



Ln index (night-time)



Noise levels
(dB)

- > 80
- 75 - 80
- 70 - 75
- 65 - 70
- 60 - 65
- 55 - 60
- 50 - 55
- 45 - 50
- < 45



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Noise Map (2009)

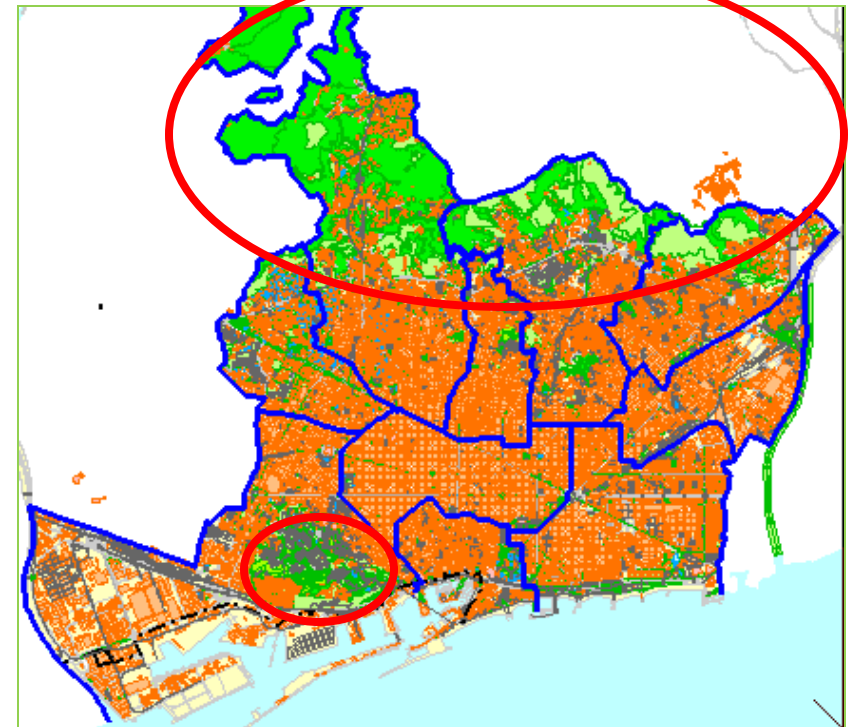
Quiet Areas

- noise levels below 50 dB during the day and 45 dB at night
- Special noise quality protection zones (ZEPQA)
- Parks and gardens
- 2.3% of the city's street sections

Hot Spots

- High noise levels due to traffic and night-time leisure activities
- Priority of improvements:
 - Where citizens are directly affected
 - Sensitive buildings (hospitals)

Quiet Areas



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Noise Map (2009)

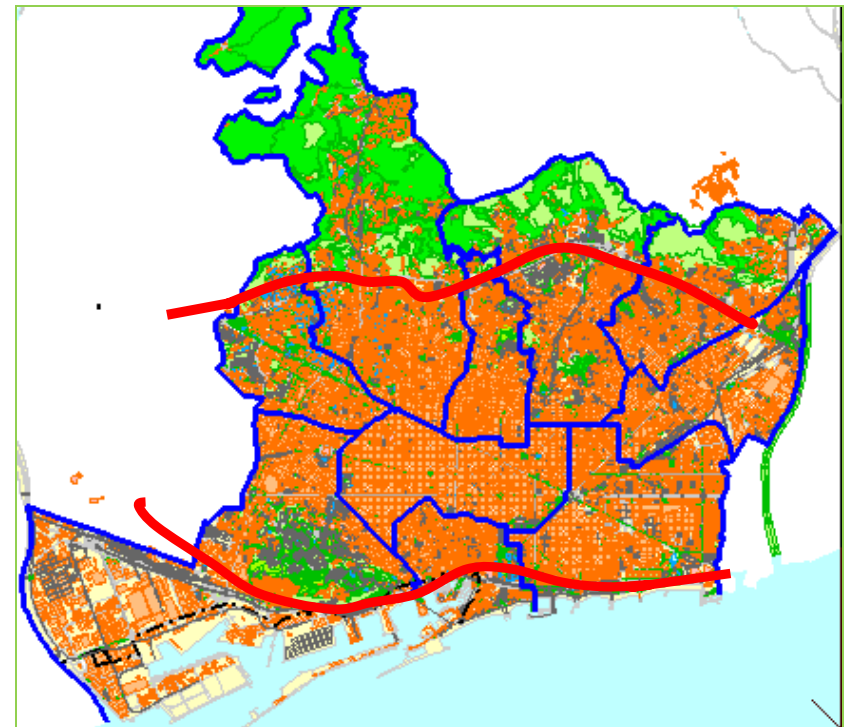
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Hot spots - traffic



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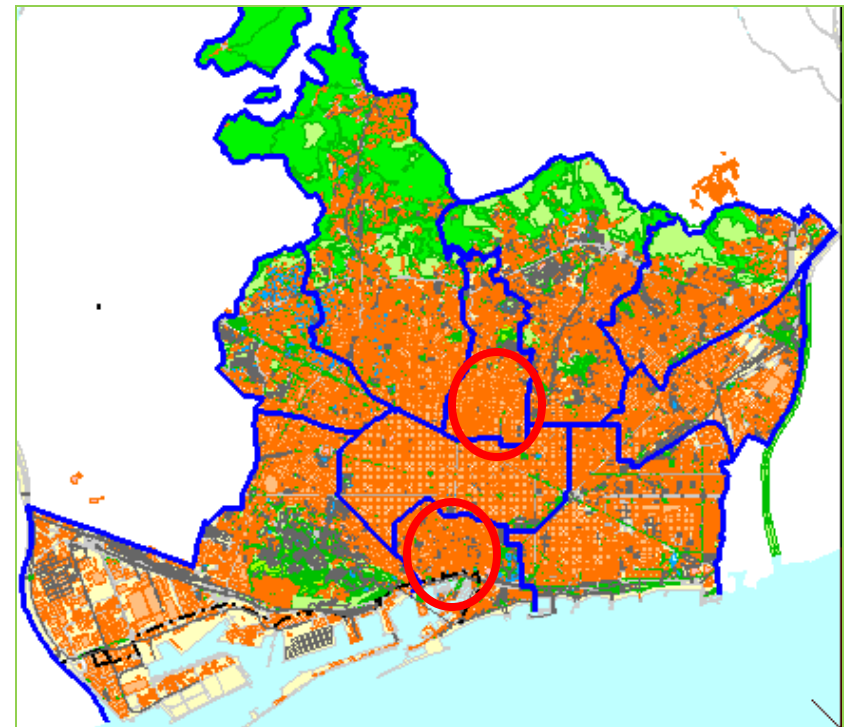
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Hot spots –
leisure activities



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Sources according Noise Map

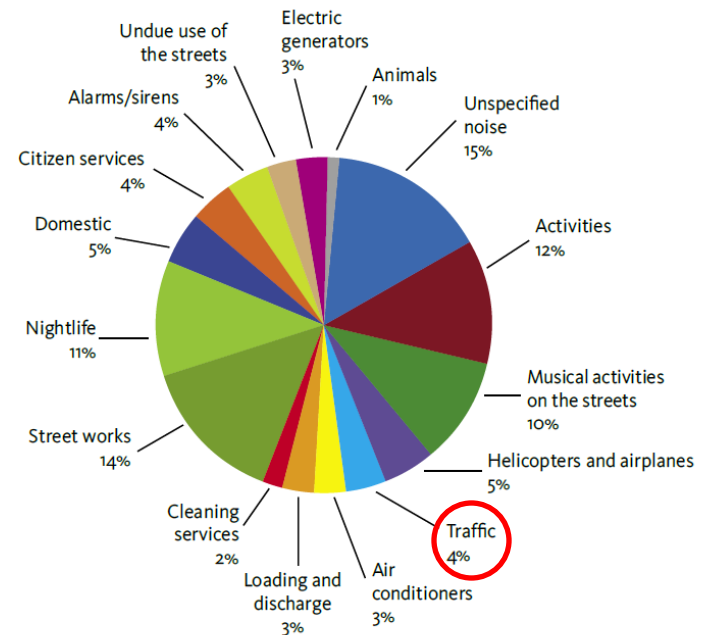
- **Traffic** due to extended use of private vehicles and rise of motorcycles
- Night time **leisure activities**

Sources according citizens' perception

- Noise produced by specific sources: public road works and night time leisure activities
- Traffic noise doesn't cause so much annoyance



Traffic noise is seen as environmental noise



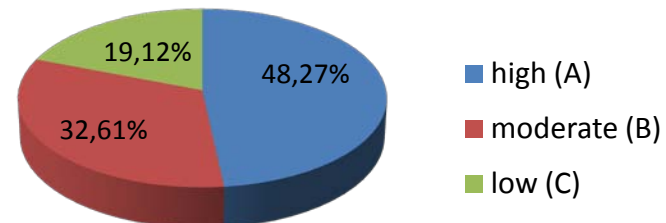
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Noise limits

Acoustic capacity map

- Seeks to set the **acoustic quality targets**
- Contains 3 main categories
 - high acoustic sensitivity zones (A)
 - moderate acoustic sensitivity zones (B)
 - low acoustic sensitivity zones (C)

Streets according to noise sensitivity



- **97.4%** of the street sections of the city comply with the acoustic capacity assigned for the day-evening time period and **88.5%** comply during the night period.

Acoustic zoning of the territory	Immission limit values in dB(A)		
	Ld (7h - 21h)	Le (21h - 23h)	Ln (23h - 7h)
High acoustic sensitivity zone (A)	60	60	50
Moderate acoustic sensitivity zone (B)	65	65	55
Low acoustic sensitivity zone (C)	70	70	60

Ld, Le and Ln, = noise immission rates for the period of day, evening and night measured over a year.

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Measures taken

Overview

- Working hard for two decades to reduce noise pollution
- Noise Department in City Council since 2004
- Key strategies:

DIAGNOSIS

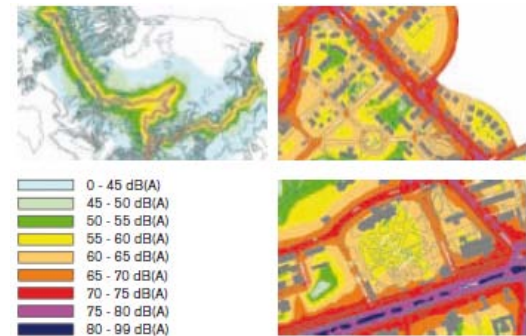
- Noise Maps: 1990, 1997, 2009
- END Strategic Noise Map: 2009

CONTROL AND PREVENTION

- Municipal Bylaws on noise: 1999, 2011

NOISE ABATEMENT

- Framework Programmes: 2001-2004, 2005-2007
- END Action Plan: 2010-2020



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Measures taken: diagnosis

END Strategic Noise Map



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Measures taken: control and prevention

Noise regulation in the city

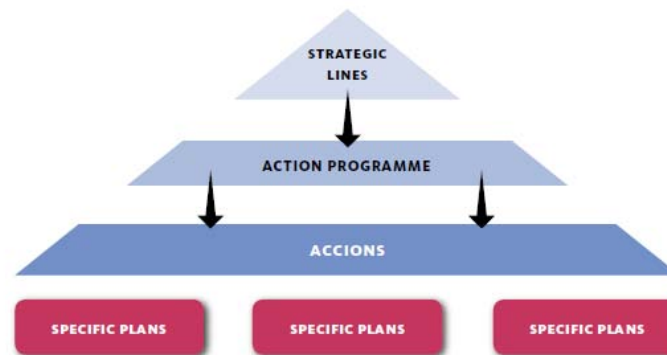
- **Shared responsibilities** on national, regional and municipal level
- Higher legislation
 - Directive 2002/49/EC
 - Spanish Noise Act 37/2003, Royal Decree 1513/2005, Royal Decree 1367/2007, Technical Building Code, Act 16/2002
 - Catalan Noise Act 16/2002, Decree 176/2009
- Recently updated **Bylaw on Urban Environment** (2011)
- Main objectives are prevention and including noise management in whole City Council
- Focused on:
 - Working hours, acoustic impact studies in civil engineering works
 - Classification of the activities in 4 groups depending on emission levels, minimum insulation required
 - Correct installation certificate of air conditioning
 - Sound level limiters in musical activities (indoor and outdoor)

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Measures taken: noise abatement

END Action Plan 2010-2020

- **Objectives** according END:
 - determine priority actions if the limits are exceeded
 - protect the quiet zones against increasing noise levels
 - drawn up with the participation of the various citizen agents
- Focused mainly on the areas of mobility, planning, services and activities
- Structured into **5 strategic areas**, developed on **8 action programmes** defined on the basis of **58 specific actions**
- Includes also **specific plans** aimed at reducing noise pollution in concrete zones of the territory
- 10-year application period.



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Measures taken: noise abatement

END Action Plan 2010-2020

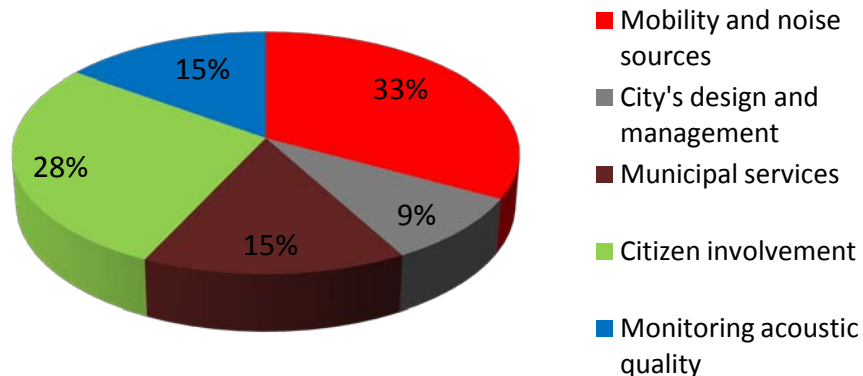
L1. Improving acoustic quality of urban space: mobility and noise sources

L2. Encouraging incorporation of acoustic criteria in the design and management of the city.

L3. Improving acoustic criteria into services management.

L4. Encouraging citizen involvement in noise pollution issues.

L5. Monitoring and assessing city's acoustic quality.



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Measures taken: noise abatement

END Action Plan 2010-2020

L1. Improving acoustic quality of urban space.

➤ Change of **mobility model**

- Promoting public transport
- Increasing pedestrian zones
- Promoting cycling:

Bike sharing system since 2007

- Well received by the inhabitants: increasing 194% journeys by bicycle 2007/2010
- To cover the small and medium daily routes (most of urban journeys)
- Several cities in metropolitan area ask to extend the service to their city



- **Minimizing** acoustic impact of specific sources: road works, loading, sirens, etc.
- **Improving** quality of priority zones and protecting city's sensitive and quiet areas
- Laying **noise reducing road surfaces** and analyzing its effectiveness
- Control of **ambulance sirens**



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Measures taken: noise abatement

END Action Plan 2010-2020

L2. Encouraging incorporation of acoustic criteria in the design and management of the city.

- Incorporation of **acoustic criteria in the design** of new urban development areas
- Incentives to reduce **noise transmission** in sensitive and priority buildings
- Promoting **insulation** in residential hotspots

L3. Improving acoustic criteria into municipal services management.

- Improving **communication** between citizens and City Council
- Internal **training** of City Council personnel



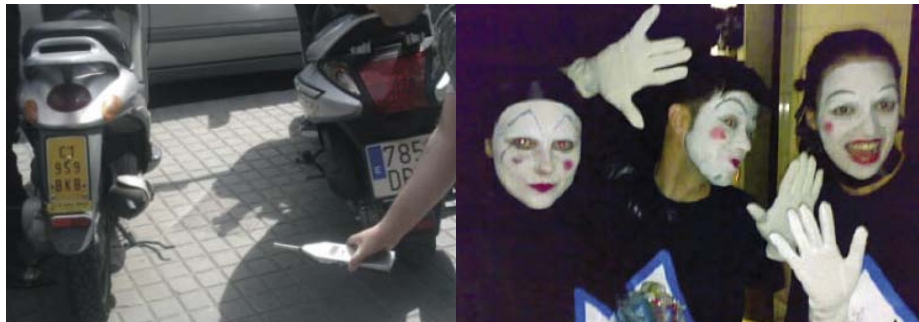
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Measures taken: noise abatement

END Action Plan 2010-2020

L4. Encouraging citizen involvement in noise pollution issues.

- Educating and raising awareness among **school community**
- Collaborating with **main agents** involved with generation of noise
- Information and encouragement of **citizens' awareness**:
 - **Awareness campaigns** to reduce night-time noise
Extended to more than 600 leisure establishments and terraces every year since 2000
Promoters and mime artists encourage civic behaviour at night
 - Campaign to **reduce noise from motorcycles**, involving measurements taken from motorcyclists



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Measures taken: noise abatement

END Action Plan 2010-2020

L5. Monitoring and assessing city's acoustic quality.

- Empowering City Council **inspection and monitoring** services
- Updating acoustic situation of the city and creating **indicators**
- Installation of **noise limiters** in public premises with music (indoor and outdoor)
 - Limit the volume of amplified music (prevention)
 - Record noise levels (control)



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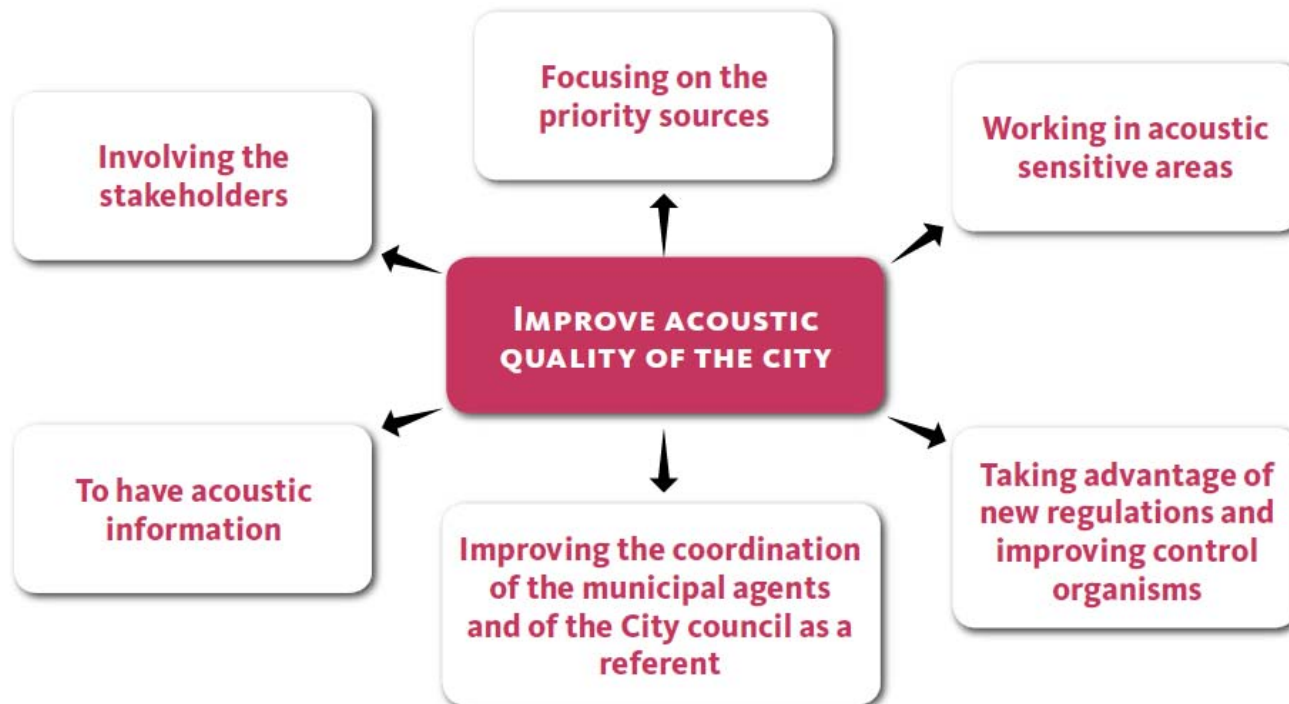


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Measures taken: overview

Barcelona City Council's strategy to improve acoustic quality



Thank you for your attention!

For further information:

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