Managing Noise in Barcelona

Barcelona City Council
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

Notable noise levels ↔ Culture of acoustic comfort
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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)
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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)

- **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.

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<table>
<thead>
<tr>
<th>Acoustic zoning of the territory</th>
<th>Immission limit values in dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ld (7h - 21h)</td>
</tr>
<tr>
<td>High acoustic sensitivity zone (A)</td>
<td>60</td>
</tr>
<tr>
<td>Moderate acoustic sensitivity zone (B)</td>
<td>65</td>
</tr>
<tr>
<td>Low acoustic sensitivity zone (C)</td>
<td>70</td>
</tr>
</tbody>
</table>

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

Overview

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

Key strategies:

**DIAGNOSIS**
- END Strategic Noise Map: 2009

**CONTROL AND PREVENTION**

**NOISE ABATEMENT**
- END Action Plan: 2010-2020
Measures taken: diagnosis

END Strategic Noise Map

- **Noise Map**
  - road sections measurement
  - acoustic prediction programmes
  - day, afternoon and night hours

- **Acoustic Capacity Map**
  - road sections
  - districts
  - day, afternoon, night hours

- **Overcoming measurements**
  - difference between existing noise and acoustic capacitation noise

- **Noise abatement measures**
  - applied to zones with problems

- **Present Situation**

- **Defined Targets**

- **Map of Conflicts**

- **Action Plans**

INTEGRATION SOFTWARE

- Traffic noise
- Industry noise
- Night leisure noise
- Commercial axes noise
- TOTAL day noise
- TOTAL evening noise
- TOTAL night noise
Measures taken: control and prevention
Noise regulation in the city

- **Shared responsibilities** on national, regional and municipal level
- Higher legislation
  - Directive 2002/49/EC
- 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)
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.

Measures taken:
- Mobility and noise sources: 33%
- City's design and management: 28%
- Municipal services: 15%
- Citizen involvement: 15%
- Monitoring acoustic quality: 9%
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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**
MANAGING NOISE IN BARCELONA

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
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)

Measures taken: noise abatement
END Action Plan 2010-2020
Measures taken: overview
Barcelona City Council’s strategy to improve acoustic quality

- Involving the stakeholders
- Focusing on the priority sources
- Working in acoustic sensitive areas
- To have acoustic information
- Improving the coordination of the municipal agents and of the City council as a referent
- Taking advantage of new regulations and improving control organisms
Thank you for your attention!

For further information:

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