

URBAN ENVIRONMENT 2.15



In 2009, Spain's population stood at 46.7 million. Of this number, 78.9% was urban and lived in the country's 750 towns and cities with over 10,000 inhabitants. The rural population (21.1%), which is in decline and widely scattered, is spread among 7,362 municipalities, of which number 4,861 have fewer than 1,000 inhabitants.

According to the 1981 population census, the urban population already accounted for a percentage close to the current figure (73.2%), which indicates that urbanisation of Spain's population is a well-established and growing trend.

The social, economic and political changes of the past few years have significantly modified the dynamics of Spain's cities and necessarily require in-depth analysis and consideration of their likely future impact.

The increase in income levels has taken place in parallel with strong development of the property market, which has left its mark on the prevailing urban planning model. This has shifted from the traditional conception of a city as compact and complex to the sprawling urban model characterised by extensive land cover, function separation, the loss of variety in new urban fabric and the proliferation in



INDICATOR	GOAL	TREND
Urban pressure on land	Achieve a sustainable balance in land use	In 2009, urban pressure continued to increase, with seven autonomous communities (plus the cities of Ceuta and Melilla) recording figures above the national average growth rate
Air quality in the urban environment	Maintain air quality within established limits	In towns and cities with over 50,000 inhabitants, average pollutant levels in 2009 were below the limit and target values
Environmental noise	Maintain environmental noise within established limits and apply the legislation currently in force	The Strategic Noise Maps produced under Directive 2002/49/EC (1st phase) indicate that 10.4 million people living in large urban conurbations, extra-urban areas and in the vicinity of airports are affected by noise
Architectural heritage of Spain's cities	Ensure heritage sites are comprehensively protected	The number of protected sites of cultural interest continues to increase and now stands at 15,849, 251 more than in 2007
Metropolitan areas: modes of public transport	Promote less pollutant modes of transport	Public Transport Authorities co-ordinate public transport in 16 metropolitan areas (covering 22 million people) and are committed to achieving sustainability by using cleaner fuels and technologies
Public participation in environmental policy	Undertake local sustainability commitments	Commitment to sustainability by local authorities through the Network of Sustainable Local Development Networks continues apace, as does active participation in the EESUL

motorised mobility. There has also been a segregation of the population according to purchasing power.

DISTRIBUTION OF SPAIN'S POPULATION BY SIZE OF MUNICIPALITY OF RESIDENCE 2009

	<10.000	10.001-20.000	20.001-50.000	50.001-100.000	100.001-500.000	>500.000
No. of municipalities	7,364	356	249	83	56	6
Population (inhab.)	9,884,916	5,021,665	7,312,406	5,854,113	11,035,190	7,637,517

Source: INE. Municipal register as at 1 January 2009

The global economic crisis that began at the end of 2008 curbed urban development and slowed the pace of urban expansion, though the inertia built up by the urban sprawl-based model that has characterised recent decades remained a potent force.

In this context, the Spanish Strategy for Urban and Local Sustainability (EESUL) promoted by the Ministry of the Environment and Rural and Marine Affairs aims to encourage profound reflection about development of the country's towns and cities. The Network of Sustainable Local Development Networks, the secretariat of which is based in the MARM, has contributed to this Strategy.

The document, which broadly reviews the challenges that need to be addressed at present, analyses in depth the various themes that make up the urban environment — spatial planning and land use, mobility, the impact of climate change, urban management, urban–rural relationships, and, finally, building.

In the same vein, it is also worth mentioning other instruments promoted by the Ministry of Housing (which is responsible for defining urban policy at a national level), such as the consolidated text of the Land Law (Legislative Royal Decree 2/2008, of 20 June), the State Housing and Renovation Plan 2009–2012 (Royal Decree 2066/2008, of 12 December) and the Urban Information System, which provides data on the urban and territorial situation and supports report production and decision-making processes (<http://siu.vivienda.es/portal/>).

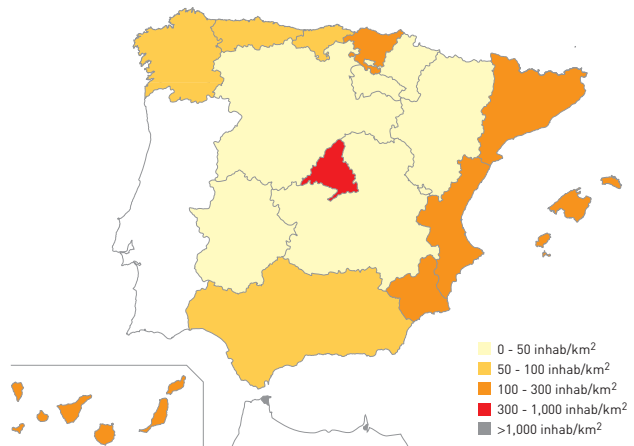
This chapter presents indicators that reflect various aspects of the situation in Spain's urban environment in relation to the targets proposed by the EESUL as regards pressure on land, air quality and environmental noise, mobility, cultural heritage and public participation.

Urban pressure on land

Pressure on land from urban centres with over 10,000 inhabitants increased over 2001–2009 in line with the general trend towards greater urbanisation, which increased nationally over the period by 17.20%

URBAN DENSITY BY AC (2009) (inhab/km²)

SPAIN /AC	Urban density 2009	Variation 2001–2009 (%)
SPAIN	72.85	17.20
Andalusia	75.57	16.13
Aragon	19.24	13.41
Asturias	88.50	2.03
Balearic Islands	183.48	30.68
Canary Islands	252.67	22.45
Cantabria	74.52	10.88
Castile-Leon	15.28	5.83
Castile-La Mancha	14.27	31.72
Catalonia	189.57	20.36
Valencia	181.69	24.96
Extremadura	13.04	12.31
Galicia	64.89	6.08
Madrid	749.56	18.57
Murcia	122.07	25.51
Navarre	33.18	19.42
Basque Country	240.99	2.41
Rioja	40.36	23.89
Ceuta and Melilla	4,754.19	5.30



Source: INE. Municipal register as at 1 January 2009 and 2001

According to data from the municipal register, the urban population living in towns and cities with over 10,000 inhabitants increased continuously between 2001 and 2009. The national rate of variation over the same period stood at 17.20%. The indicator shows the pressure exerted on land by population centres with over 10,000 inhabitants and is calculated by relating the population living in these municipalities to each autonomous community's total land area.

Greatest urban density was found in the autonomous communities of Madrid (749.56 inhab/km²), the Canary Islands (252.67 inhab/km²), the Basque Country (240.99 inhab/km²), Catalonia (189.57 inhab/km²), the Balearic Islands (183.48 inhab/km²), Valencia (181.69 inhab/km²) and Murcia (122.07 inhab/km²). Asturias, Andalusia and Cantabria are also above the national average (72.8),

while Spain's other autonomous communities are all below it. Due to their small size and high population density, the demographic situation in Ceuta and Melilla is not comparable to that in the autonomous communities.

The urban population in all of Spain's autonomous communities increased over the period 2001–2009, though the Balearic Islands, Castile-La Mancha, the Canary Islands, Valencia, Murcia, Rioja and Catalonia all recorded growth rates above the national average. At the other end of the scale were Galicia, Castile-Leon, the Basque Country and Asturias.

As regards the changes between 2008 and 2009, the urban population increased in all of Spain's autonomous communities, although only seven (and Ceuta–Melilla) were above the national average (1.58%). Castile-La Mancha (4.10%) and Navarre (4.07%) experienced particularly significant growth in this respect. Meanwhile, Castile-Leon, the Basque Country and Cantabria, all of which grew by less than 1%, recorded the smallest increases.

NOTES

- The indicator represents the pressure exerted on land by urban population centres with over 10,000 inhabitants. It is calculated as the coefficient of the population living in these municipalities and the surface area of each respective autonomous community. For the purpose of calculating the indicator, the data provided by the municipal register as at 1 January 2001 and at 1 January 2009 were used. The increase in the number of inhabitants between the two dates is very large, particularly in those autonomous communities that encourage the construction and service industries, as these attract a significant influx of immigrants.
- From a demographic point of view, Spain's urban structure comprises 83 urban areas with over 50,000 inhabitants. Of these areas, 4 have over one million inhabitants (Madrid, Barcelona, Valencia and Seville), three of which (except the capital, Madrid) are located on the peninsula's periphery. There are 10 urban areas with populations of 500,000–1,000,000 inhabitants (Malaga, Bilbao, Central Asturias, Saragossa, Alicante/Elche, Bay of Cadiz, Murcia, Vigo–Pontevedra, Las Palmas de Gran Canaria, and Palma de Mallorca), and there are a further 29 urban areas with 50,000–100,000 inhabitants. Currently, with the exception of the metropolitan area of Madrid, which is growing strongly, greatest population expansion is found in intermediate areas like Malaga, Alicante/Elche, Murcia, and Palma de Mallorca. Therefore, the trend of growth on the periphery, especially around the Mediterranean Arc (closely tied to tourism), and in the centre of the country around Madrid, remains unchanged. The total population of Spain (according to the municipal register as at 1 January 2009) was 46,745,807.
- Although the indicator does not take into consideration the population living in towns of less than 10,000 inhabitants (rural population), it should be noted that the boundary between the urban and rural environments is becoming ever-more blurred as a result of urban sprawl, which is increasingly affecting the rural environment, especially on the urban fringe of the country's large and medium-sized conurbations.

SOURCES

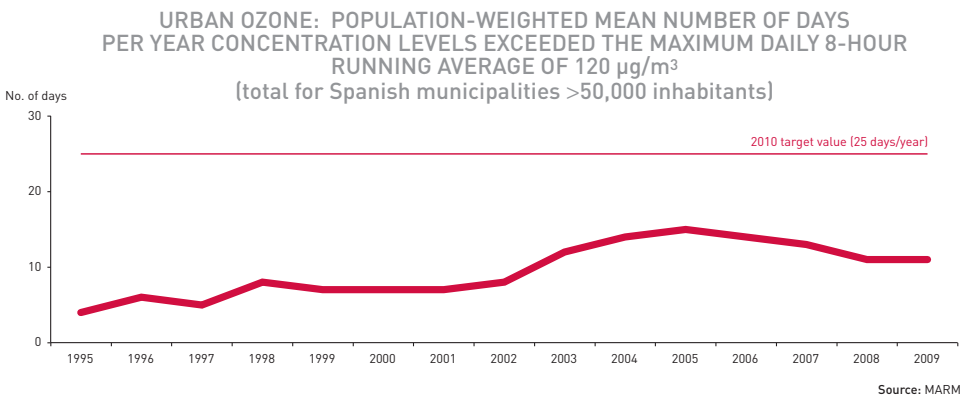
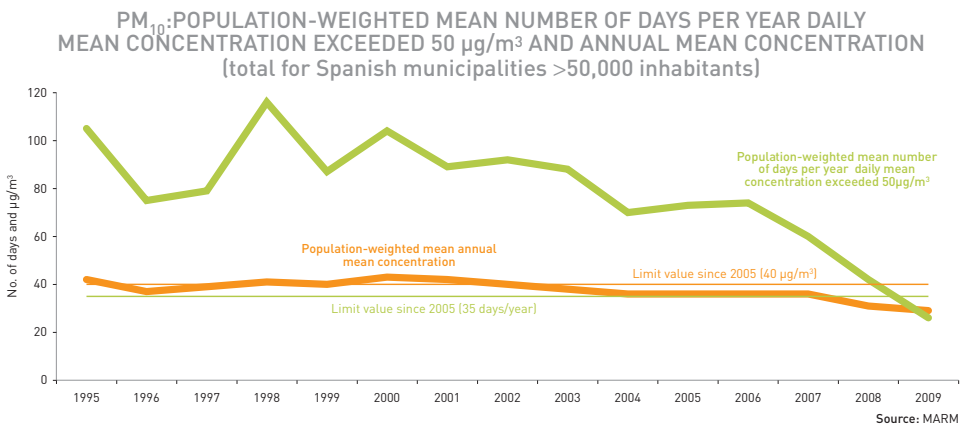
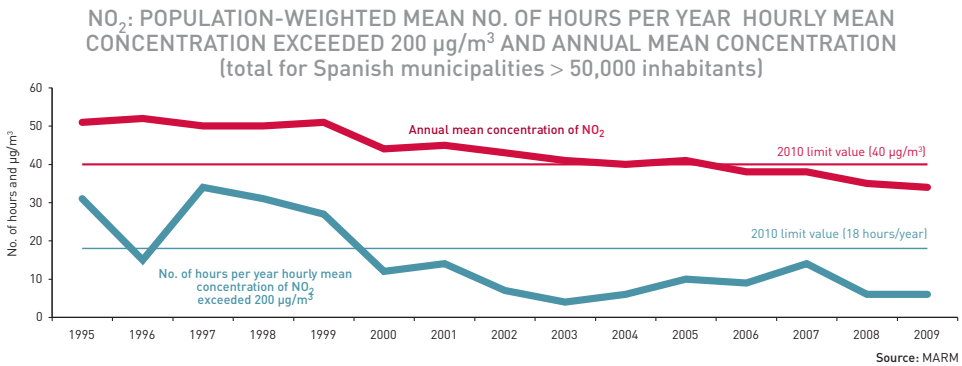
- INE. Municipal register as at 1 January 2001 and at 1 January 2009.
- Geographic area: INEbase figures.

FURTHER INFORMATION

- <http://www.ine.es>

Air quality in the urban environment

In towns and cities with over 50,000 inhabitants, average levels of NO_2 , PM_{10} and O_3 in 2009 were under the regulatory limits



Average air quality in Spanish municipalities with over 50,000 inhabitants, analysed in terms of the limit and target values set by the legislation for NO₂, suspended particulate matter smaller than 10 microns (PM₁₀) and ozone (O₃), is described below.

From 2000 onwards, the weighted mean number of hours in which mean hourly concentrations of NO₂ (generated mainly by road traffic, industry and the domestic sector) exceeded 200 µg/m³ was below the limit value set by the legislation for 2010, although there was also a small increase between 2003 and 2007. The weighted annual mean concentration showed a steady decline and was already below the limit value of 40 µg/m³ by 2006.

The mean value for suspended particulate matter smaller than 10 µm (PM₁₀), arguably the main air quality problem in the majority of Spanish towns and cities, improved slightly in population centres with over 50,000 inhabitants — in 2009, the population-weighted mean number of days per year in which the daily mean concentration exceeded 50 µg/m³ was below the 35-day limit in force since 2005. Although since 1998 (the year in which the limit value was exceeded by the greatest margin) the trend has been downward, 2009 was the first year in which the level was below the regulatory limit.

For its part, the situation as regards the population-weighted mean of the annual mean concentration of PM₁₀ is even more favourable and the level recorded has not exceeded the limit value set for 2005 since 2002.

In relation to urban ozone (a secondary photochemical pollutant generated by various gases emitted by combustion processes in cities and industrial areas), the population-weighted mean number of days per year in which concentration levels exceeded the maximum daily 8-hour running average of 120 µg/m³ was well below the target value for 2010. This was due in part to the fact that a large number of the stations measure traffic emissions and that the background ozone levels recorded by these are relatively low in comparison with those found in suburban or rural areas.

This variable is calculated from the triennial mean number of exceedances in order to reduce seasonal variability and monitor the level more precisely. As can be seen in the graph, from 2002 onwards there was a slight increase that continued until 2005 (due mainly to the high temperatures recorded in those years). After 2005, the level fell once more and by 2009 it was similar to the value recorded in 2003.

NOTES

- A proprietary methodology has been used to produce a representative mean value to describe the quality of the air breathed in Spanish towns and cities. For each pollutant, the mean value for all of the stations belonging to each municipality with over 50,000 inhabitants (provided a sufficient amount of valid data is available) was multiplied by the population of that municipality. The sum of these values for all of the municipalities included, divided by the total population of the same, provides the weighted mean value. This weighted mean was used for all of the municipalities with over 50,000 inhabitants. In the case of ozone, the indicator, in accordance with applicable legislation, is based on the triennial mean.
- All stations with sufficient data (85% for daily and hourly exceedances and 50% for annual mean concentrations) were taken into account. Even so, it is worth highlighting that the mean value obtained is a representation of the mean situation as regards that pollutant, and there may be considerable differences between this value and occasional situations that may arise in towns and cities.
- Station location, type (traffic, industrial or background), and percentage of valid data are three of the aspects that condition calculation of the variables and, therefore, the final indicator. Another way to proceed would be to monitor the variables of specific stations located at representative sites and that had a sufficient quantity of valid data. Monitoring the resulting trends would provide an idea of air quality at those specific points, though this information would bear no relation to an estimate of general air quality throughout the country in towns and cities with a population of over 50,000 inhabitants, which is this indicator's aim.
- The indicator monitors the variables covered by the European Common Indicators (ECI) project and presents trends in these in comparison with the limit and target values set for 2005 and 2010 under current legislation (Royal Decree 1073/2002, on nitrogen dioxide (NO₂) and suspended particulate matter smaller than 10µm (PM₁₀), and Royal Decree 1796/2003, on ozone).
- The total number of stations considered when calculating the indicators varied throughout the period and had a significant effect on the final result. Thus, the breakdown in percentage terms of the industrial/traffic/background stations was 18.9/73.6/7.5 in 1995, 19.5/67.0/13.5 in 2000, 21.7/50.9/27.4 in 2005, and 21.6/44.0/34.4 in 2009.
- It should be noted that the analysis does not include changes in concentrations of SO₂ and CO, owing to the fact that in urban environments these do not represent a problem. Use of low-sulphur fuels and replacement of coal-burning boilers with natural gas units, among other measures, have led to an improvement in air quality in terms of SO₂ concentration. From 2002 onwards, the limit value for CO (daily mean maximum of 10 mg/m³ measured as an 8-hour running average) was not exceeded.

SOURCES

- Air Quality Database. Sub-Directorate General for Air Quality and the Industrial Environment. Directorate-General for Environmental Quality and Assessment. MARM.

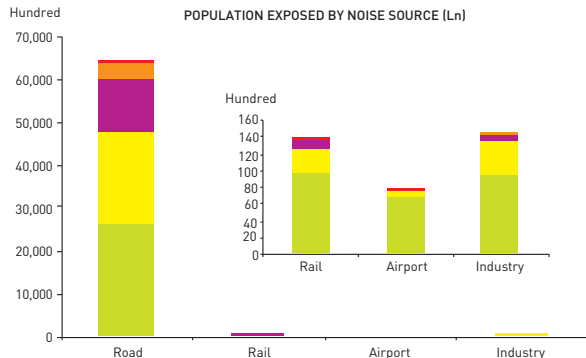
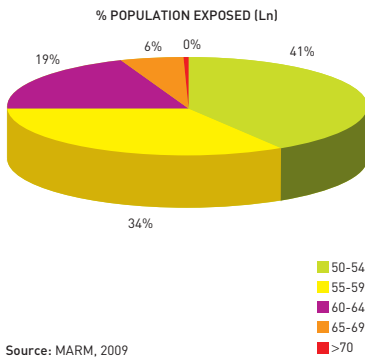
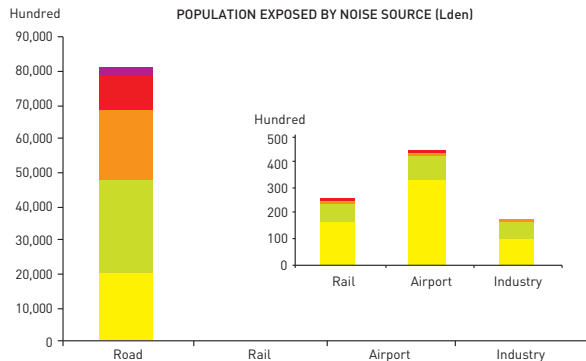
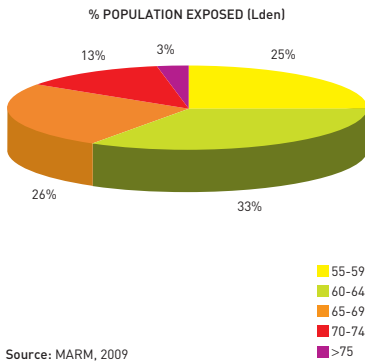
FURTHER INFORMATION

- www.marm.es
- www.eea.europa.eu

Environmental noise

In Spain's large urban conurbations, 8,130,800 people are affected by noise from road and rail traffic, airports and industrial facilities

NOISE LEVELS IN URBAN CONURBATIONS:
Lden AND Ln INDICATORS (expressed in hundreds)



The European Union has created a legislative framework (Directive 2002/49/EC, of 25 June) to combat noise pollution and establish a means of avoiding, preventing or reducing the harmful effects of exposure to environmental noise. Transposition of this Directive into Spanish law (Law 37/2003, of 17 November, on noise) and its further development established a timetable for the production of noise maps to be used as a basis for establishing Action Plans. The Strategic Noise Maps produced in the first phase of implementation of the Directive indicated that a total of 8,130,800 people living in large urban conurbations were affected by noise from road and rail traffic, airports and industrial facilities.

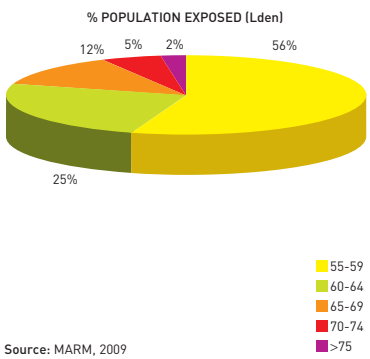
Outside these conurbations, the number of people affected by major roads stood

at 2,116,100, while those affected by major railways totalled 81,800 and the number affected by major airports reached 143,700.

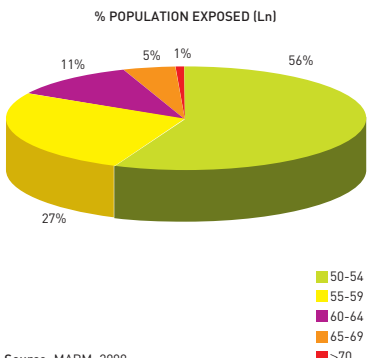
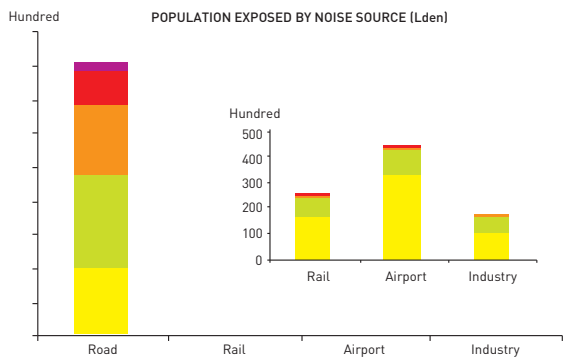
Implementation of Law 37/2003, of 17 November, on noise, and its related regulations during 2009 continued to collect information from autonomous communities on the impact of major road and rail links. The information submitted totalled 84% and 82%, respectively, of the volume initially reported to the European Commission. With respect to conurbations, the information on the 19 reported conurbations has been completed.

The regulations referred to in this chapter are Royal Decree 1513/2005, on the assessment and management of environmental noise, which transposed into Spanish law Directive 2002/49/EC of 25 June, and Royal Decree 1367/2007, on noise zoning, quality targets and noise emissions.

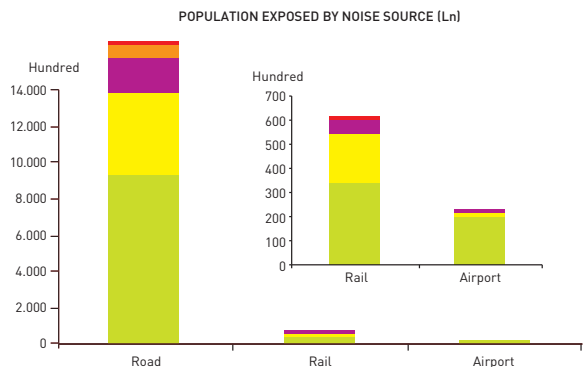
**NOISE LEVELS GENERATED BY TRANSPORT INFRASTRUCTURE:
MAJOR ROADS, MAJOR RAILWAYS AND AIRPORTS. Lden AND Ln INDICATORS
(expressed in hundreds)**



Source: MARM, 2009



Source: MARM, 2009



Strategic Noise Maps have been drawn up for 393 sections or groups of sections along a total of 7,896.32 km of roads and 20 sections or groups of sections along a total of 742.15 km of railway track.

Strategic Noise Maps have been completed for the 19 conurbations identified in the first phase. These cover a population of 11.9 million people, of which 68% are affected by an $L_{den} > 55$ dB.

Strategic Noise Maps provide an extremely useful tool with which to identify the noise level to which the population is exposed and serve as the basis for acoustic planning in cities and around major infrastructure. This planning is carried out through the Action Plans to Combat Noise, which indicate the measures needed to improve acoustic quality for affected populations.

NOTES

- The indicators used to produce the Strategic Noise Maps are L_{den} , L_d , L_t and L_n , as defined by Royal Decree 1513/2005, which implements Law 37/2003, on noise, relating to assessment and management of environmental noise. L_{den} is associated with overall discomfort; L_d and L_e show, respectively, the noise level and associated discomfort during the daytime and evening; and L_n is an indicator associated with sleep disturbance.
- The large conurbations referred to by the indicators are Alicante, Barcelona (I and II), Baix Llobregat, Bilbao, Córdoba, Gijón, Madrid, Málaga, Murcia, Palma de Mallorca, Las Palmas de Gran Canaria, Santa Cruz de Tenerife–San Cristóbal de la Laguna, Seville, Valencia, Valladolid, Vigo and Saragossa. Strategic Noise Maps have been created for the airports of Alicante, Barcelona, Bilbao, Gran Canaria, Madrid-Barajas, Málaga, Palma de Mallorca, Tenerife Norte, Tenerife Sur and Valencia.
- A Strategic Noise Map comprises:
 - **Noise level maps** (L_{den} , L_d , L_e , L_n), which show immission levels and isophones for predetermined intervals in a range of predefined colours to facilitate comparison. In general, the scale used is 1:25,000 (except on the detailed maps that use 1:5,000 in areas of high population density, areas of special interest, and in conflictive areas that do not meet noise quality targets).
 - **Exposure maps**, which show data about buildings, housing units and population exposed to certain noise levels at building facades and other data required by the Directive. The maps differentiate between educational and health facilities. Table 2 shows the area affected by state-owned transport infrastructure within the $L_{den} > 55$ and $L_{den} > 65$ isophones, as well as housing units (in hundreds), hospitals and educational institutions exposed to the same noise levels.
 - **Affected area maps**, which show the total surface area (km²) exposed to $L_{den} > 55$, > 65 and > 75 , and report the estimated total number of housing units and people (in hundreds) within each of these areas, as well as hospitals and schools exposed to these noise ranges.

SOURCES

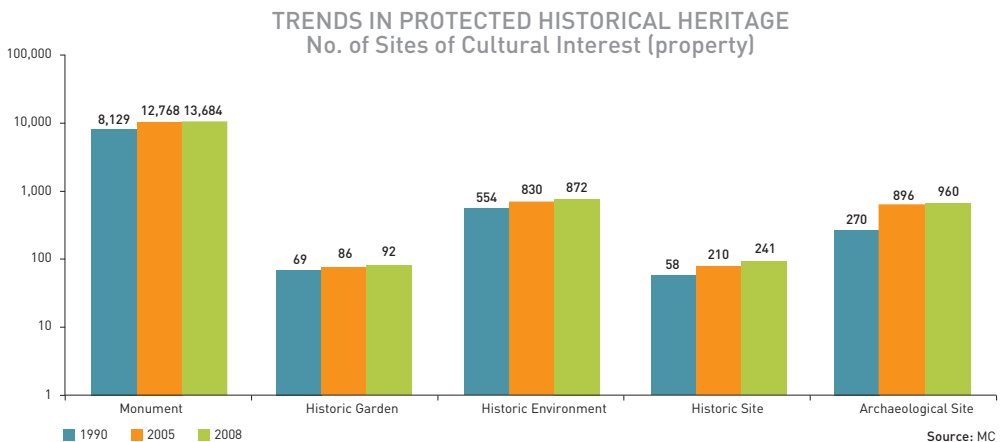
- SICA (Basic Noise Pollution Information System). Sub-Directorate for Air Quality and the Industrial Environment. Directorate-General for Environmental Quality and Assessment. MARM.
- First phase of production of Strategic Noise Maps for Spain's state-owned road network: Summary of results and PAR Action Plan 2008-2012, September 2008, Madrid. MF. Directorate-General for Highways [report]. <http://www.cedex.es/egra/DOCUMENTACION/Memoria.pdf>.

FURTHER INFORMATION

- <http://sicaweb.cedex.es>
- http://eea.eionet.europa.eu/Public/irc/eionet-circle/eione_noise/library
- <http://ec.europa.eu/environment/noise/>

Architectural heritage of Spain's cities

In 2008, 15,849 Sites of Cultural Interest (86.3% of which were classified as monuments) were protected by legislation designed to safeguard Spain's architectural heritage



Urban landscapes consist largely of buildings. Those that become repositories of the location's historical memory define the local environment and, with the passage of time, come to constitute one of their inhabitants' identifying traits. Preserving and highlighting these buildings is an essential element of advanced urban planning and sustainable development that, as is well known, endeavours to balance economic, social and environmental interests.

Spain's cities are home to a significant number of monuments, protection of which is guaranteed by Law 16/1985, of 25 June, on Spain's historical heritage. The Ministry of Culture's work in relation to the country's historical heritage is carried out in co-ordination with the various regional governments. To fund this, the Law makes it compulsory for public works contracts to allocate at least 1% of their budget to conservation or enhancement of historical heritage.

The indicator measures the number of Sites of Cultural Interest (SCI) classified as property. It shows that in 2008 there were 15,849 such Sites, 251 more than the year before (up 1.61%). Monuments accounted for 86.34% of the total number of properties, followed by archaeological sites (6.06%), historic environments (5.5%), historic sites (1.52%) and historic gardens (0.58%).

As regards the breakdown by autonomous community, notably five of them were

home to more than half the total number (65.9%) of properties declared Sites of Cultural Interest, among which the Balearic Islands (3,015), Andalusia (2,880), Catalonia (2,203) and Valencia (1,055) all had over 1,000 registered SCIs. Nationally, there were 3.4 Sites of Cultural Interest for every 10,000 inhabitants. By autonomous community, the Balearic Islands once again took first place with 28.1 per 10,000 inhabitants, followed by Ceuta (12.1), Aragon (5.9), Castile-Leon (5.1), Cantabria (5.1), Castile-La Mancha (3.8) and Murcia (3.6).

According to the *Survey of Cultural Habits and Practices*, 34.1% of Spain's population visited a monument of some kind in 2007, compared to 27.5% in 2003, which would seem to indicate an increase in the population's interest in Spain's historical heritage and greater opportunity to satisfy it.

NOTES

- The European Union's ministers of culture issued a joint statement (Madrid, 25 January 2007) endorsing the European Heritage Label created "to promote the transnational dimension of European cultural assets, monuments, natural and urban enclaves, tangible and intangible heritage, contemporary and traditional heritage and places that have played an essential role in the construction and consolidation of Europe." By the end of 2009, 19 European countries had included sites catalogued under the European Heritage Label in the heritage network, which now comprises over 60 entries. To date, Spain has included in this network the Archive of the Crown of Aragon, the Royal Monastery of Saint Jerome of Yuste, Cape Finisterre, and the Students' Hall of Residence in Madrid.
- The Ministry of Culture is implementing four major plans designed to protect Spain's historical heritage — the Cathedrals Plan, which has been applied to 90 cathedral environments since 1997; the Industrial Heritage Plan, which was launched in 2000 and protects sites and environments representative of industry; the Defensive Architecture Plan, which protects historical castles, walls and defensive structures; and finally, the Cultural Landscape Plan, which is currently under development. These plans are led by the Spanish Cultural Heritage Institute (IPCE), which also establishes the main lines of research into the country's heritage.
- The draft of the Cultural Landscape Plan has its legal basis in articles 46 and 149.2 of the Spanish Constitution and must take into account national and local legislation affecting the fields of heritage, environment, land and spatial planning, as well as Spain's commitments under the UNESCO World Heritage Convention and the Council of Europe's European Landscape Convention. The term cultural landscape refers to "a complex reality, integrated by natural and cultural, tangible and intangible components, the combination of which make up its identifying character."

SOURCES

- MC, 2009. Anuario de Estadísticas Culturales, 2008.

FURTHER INFORMATION

- <http://www.mcu.es>

Metropolitan areas: modes of public transport

Spain's 16 metropolitan Public Transport Authorities operated 2,690 city and inter-city bus lines covering 70,000 km, as well as 3,000 km of railway and 1,500 stations

SPAIN'S METROPOLITAN PUBLIC TRANSPORT AUTHORITIES (2007)

Metropolitan area	No. of municipalities	Size of metropolitan area (km ²)	Population of metropolitan area (1/1/2007)	Developed area (km ²)	Density of metropolitan area (inhab/km ²)	Density of main city (inhab/km ²)	Main city-to-MA population ratio (%)
Madrid	179	8,030	6,081,689	1,040	757	5,171	52
Barcelona	164	3,239	4,856,579	539	1,500	15,714	33
Valencia	60	1,415	1,739,946	325	1,230	5,829	46
Seville	31	1,851	1,246,460	317	674	4,735	54
Biscay	111	2,217	1,141,457	n.a.	515	8,614	31
Asturias	78	10,604	1,074,862	n.a.	101	1,160	20
Malaga	13	1,258	944,815	75	751	1,422	59
Gran Canaria	21	1,560	815,379	330	523	3,753	46
Majorca	53	3,624	814,275	180	225	1,794	47
Saragossa	35	2,234	731,998	116	328	611	89
Bay of Cadiz	8	2,425	663,510	80	274	10,452	19
Granada	32	861	489,480	n.a.	569	12,176	48
Murcia (municipality)	1*	n.a.	n.a.	n.a.	n.a.	477	n.a.
Alicante	5	355	438,430	74	1,235	1,605	74
Pamplona	17	82	309,607	n.a.	3,779	7,765	63
Vigo	1		297,028	109	n.a.	2,725	100

Source: OMM, 2009.

Notes: The table is arranged in descending order by size of population of the metropolitan area [MA]. [n.a.] data not available. [*] The city of Murcia municipal district comprises 54 outlying districts. Murcia [municipality] has a population of 422,861 inhabitants and covers 886 km². In previous editions, the report included the metropolitan areas of Camp de Tarragona (530,115 inhab) and Corunna (244,388 inhab).

According to the latest report by the Metropolitan Mobility Monitoring Centre (OMM), in 2007 the resident population served by Spain's metropolitan Public Transport Authorities (PTAs) stood at 22 million people. The PTAs covered an area of 40,750 km², of which 10.4% (4,239 km²) belonged to each respective city, which served as the conurbation's focal point. The 16 PTAs listed in the latest report cover 809 municipalities, including Spain's five most highly populated cities.

In 2007, two new authorities were added to the list — the Majorca Transport Consortium and the Region of Murcia Public Transport Authority. The first, which was established by Law 8/2006, of 14 June, co-ordinates the various modes of

transport and operators that constitute Majorca's terrestrial public transport system. The transport network covers the entire island (53 municipalities) and comprises 103 inter-city bus lines operated by the Municipal Transport Authority and 14 private companies, as well as 2 railway lines and an underground Metro line.

The Region of Murcia Public Transport Authority acts as the sole public road transport authority for the entire autonomous community, although for the moment the data available refer only to the city of Murcia and its 53 outlying districts, which encompass a total of 886 km². Within this environment, the public transport system comprises 41 bus lines and a tram line opened in 2007.

The PTAs' infrastructure includes one or more modes of transport, principally city and metropolitan bus routes and railway networks. Only in one case (Pamplona), does a PTA operate taxis. According to the data available, city lines total approximately 10,000 km and metropolitan lines 50,000 km. This figure could reach 70,000 km once data for Asturias and the whole of the Region of Murcia become available.

LENGTH OF BUS LINES (KM) AND NUMBER OF STOPS
IN AREAS COVERED BY METROPOLITAN PUBLIC TRANSPORT AUTHORITIES (2007)

	Number of lines		Number of stops		Line length (km)	
	City	Metropolitan	City	Metropolitan	City	Metropolitan
Madrid	208	459	10,024	20,467	3,725	21,065
Barcelona	109	515	5,495	19,150	1,808	9,001
Valencia	59	57	2,031	1,942	871	2,126
Seville	40	51	1,680	920	531	1,567
Asturias*	14	362	751	n.d.	196	n.d.
Malaga	40	69	1,785	650	613	2,039
Gran Canaria	40	146	772	4,579	713	3,113
Majorca	25	103	1,715	1,267	640	2,110
Saragossa	38	44	1,739	1,956	557	3,551
Bay of Cadiz	n.d.	44	n.d.	951	n.d.	2,586
Granada	28	55	n.d.	n.d.	345	1,502
Murcia (municipality)	41	n.d.	3,410	4,730	788	n.d.
Alicante	13	27	n.d.	n.d.	246	510
Pamplona	21		723		359	
Vigo	30		1,050		n.a.	

(*) The data for the city network in Asturias refer exclusively to Oviedo. Inter-city lines in Asturias and Murcia (for which data are not yet available) could total a further 3,000 km per autonomous community.
Source: OMM, 2009.

Mid-sized areas, such as Gran Canaria, Saragossa or Granada, had the highest density of bus lines per inhabitant (4,000–5,000 km per million inhabitants). In relation to area, the highest densities were found in both the largest and the smallest metropolitan areas (3,000–4,000 km/1,000 km²).

LENGTH OF RAILWAY NETWORK (KM) AND NUMBER OF STATIONS IN PTA AREAS (2007)

	Metro	Tram/light railway	RENFE	FEVE	Regional rail networks	Total railway (km)	Total no. of stations
Barcelona	110.3	28.4	440.6	-	120.0	699.3	350
Madrid	283.3	36.0	367.4	-	-	686.7	434
Asturias*	-	-	117.7	459.73	-	577.4	217
Valencia*	121.7	15.9	355.0	-	-	492.6	182
Murcia (municipality)	-	2.2	203.0	-	-	205.2	33
Seville**	-	1.3	155.9	-	-	157.2	27
Malaga	-	-	67.9	-	-	67.9	25
Majorca	12	-	-	-	82	-	23
Bay of Cadiz	-	-	51.2	-	-	51.2	12
Alicante	-	18.4	-	-	-	18.4	21

Source: OMM, 2009.

[*] 2006. [**] On 1 April 2009, line 1 of the Seville Metro system (18 km long with 22 stations) was opened.

In 2007, the various modes of rail transport totalled 3,050 km, distributed as shown in the table. In relation to density (km/area), Valencia, Barcelona, Madrid and Seville had the highest ratios, while the metropolitan areas of Malaga, Majorca, Bay of Cadiz and Murcia had the lowest. In relation to population, the highest densities were in Asturias and Valencia, and the lowest were in Malaga and Alicante. Metropolitan rail networks carried the greatest number of passengers, which in 2007 totalled 1.21 billion. Of this volume, the Madrid Metro accounted for 56.8%, the Barcelona Metro for 30.3% and the Bilbao and Valencia Metro systems for 7.1% and 5.8%, respectively.

Pamplona is the only PTA that operates taxis. The number of taxi licences in Spain stood at 44,209, of which number 84% served the main city in each metropolitan area. The highest density of taxis in relation to population was found in Barcelona, followed by Madrid, Gran Canaria and Seville.

PTAs are opting for fleets of more environmentally friendly buses that incorporate cleaner technologies and run on more efficient fuels. In the urban environment, this trend is already significant, above all as regards vehicles powered by biodiesel and natural gas. In contrast, in metropolitan areas the proportion of low-emission vehicles is much lower. The table below shows the percentages of city and inter-city bus fleets comprising low-emission vehicles.

LOW-EMISSION METROPOLITAN BUSES AS A PERCENTAGE OF THE TOTAL FLEET (2007)

	Euro IV	Biodiesel	TOTAL
Pamplona ⁽¹⁾	-	37.0	37.0
Madrid	1.4	19.4	20.8
Granada	14.7	1.1	15.8
Asturias	8.4	5.4	13.8
Bay of Cadiz	-	11.3	11.3
Malaga	3.1	7.2	10.3
Seville	-	4.0	4.0
Gran Canaria	0.8	-	0.8

Source: OMM, 2009. (1) Pamplona uses pure biodiesel.

LOW-EMISSION CITY BUSES AS A PERCENTAGE OF THE TOTAL FLEET (2007)

	Euro IV	CNG	LPG	Hybrid	Biodiesel	Other*	TOTAL (%)
Asturias ⁽¹⁾	-	-	-	-	100.0	-	100.0
Madrid	0.2	17.3	-	1.0	42.4	0.7	61.6
Malaga ⁽²⁾	-	1.6	-	-	53.8	0.4	55.8
Sevilla	-	21.8	-	-	26.4	0.5	48.7
Valencia	-	14.6	-	-	20.8	-	35.4
Barcelona	-	19.3	-	-	-	0.3	19.6
Murcia (municipality)	17.0	-	-	-	-	-	17.0
Vigo	19.0	-	2.6	-	-	-	21.6
Gran Canaria	8.9	-	0.8	-	-	-	9.7

Source: OMM, 2009.

Notes: (1) Only includes Oviedo. (2) Others: Euro V (*). Others: hydrogen and bioethanol. CNG: compressed natural gas. LPG: liquefied petroleum gas.

NOTES

- Metropolitan area: In accordance with the criteria established by the OMM, a metropolitan area is defined as "an urban geographical area with a high degree of interaction between its various urban centres in terms of journeys, day-to-day relationships, economic activity, etc." A single definition has not been established to demarcate Spain's metropolitan areas.
- It should be noted that the concept of metropolitan area used in this indicator does not coincide with that used in urban planning, since it is limited to the scope of Spain's public transport authorities. Thus, in the case of Madrid, the Transport Consortium includes all of the autonomous community's 179 municipalities, while its metropolitan area only includes 27 municipalities.
- The PTAs are broken down into three groups according to the size of the population they serve — large-sized (Madrid, Barcelona, Valencia, Seville, Biscay and Asturias); medium-sized (Malaga, Gran Canaria, Majorca, Sagorossa and Bay of Cadiz); and small-sized (Granada, Alicante, Murcia, Pamplona and Vigo). The highest population density in a metropolitan area comprising a single municipality (excluding Vigo and Murcia) was found in Pamplona, followed by Barcelona, Alicante and Valencia. As regards density in the area's main city, the highest was found in Barcelona, followed by Granada, Cadiz and Biscay.

SOURCES

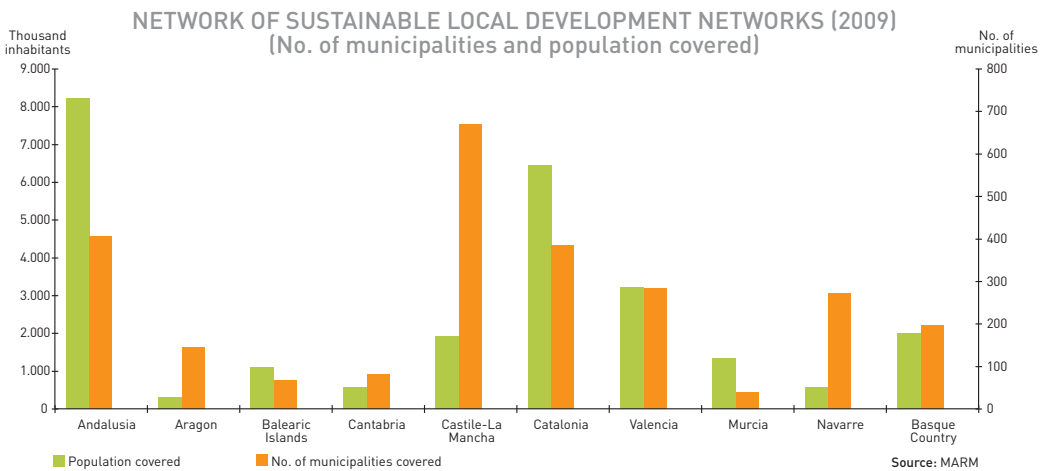
- MARM. MF: OMM. Working paper. OMM 2007 report. Madrid, July 2009.
- OMM: 6th Conference: Las Autoridades de Transporte: por un aire limpio para todos. Las Palmas, July 2009. [various papers].
- MF: Anuario estadístico 2008

FURTHER INFORMATION

- <http://europa.eu/scadplus/leg/es/lvb/l24484.htm>
- <http://www.fomento.es>
- <http://www.transyt.upm.es>

Public participation in environmental policy

Public participation in environmental policy is articulated through organisations such as the Network of Sustainable Local Development Networks and the Spanish Network of Cities for Climate promoted by the MARM



The effectiveness of environmental policy largely depends on the degree of public participation in each and every stage of the process, from the moment of conception through to implementation. This is how the issue is understood by the European Commission in regulations relating to governance, among which mention should be made of “*European governance — A white paper*” [COM(2001) 428 final], and subsequent Communications (2003 and 2006) on the same subject. This chapter presents the data available on two of the public participation initiatives promoted by the Ministry of the Environment and Rural and Marine Affairs to achieve sustainability at municipal level and implement Local Agenda 21.

The Network of Sustainable Local Development Networks is a forum founded in December 2005. It currently comprises 2,706 municipalities, which in turn are home to 26 million people. The MARM acts as the Network’s secretariat. It should be noted that ten autonomous communities belong to the Network and that participation by municipalities within these is high (in the case of the Balearic Islands, participation stands at 100%). Approximately 80% of the population of the autonomous communities registered is covered by the Network. In 2009, two new networks were incorporated.

In September 2009, the 11th Plenary Meeting (held in Albacete on 17 September) adopted the draft of the EESUL, production of which involved contributions from Network members. In addition, a Working Group was set up to develop indicators of urban sustainability.

NETWORK OF SUSTAINABLE LOCAL DEVELOPMENT NETWORKS (2009)

Network	No. of municipalities/local authorities	Population
Ciudad 21 Environmental Sustainability Programme – Andalusia	231	6,998,725
Network of Sustainable Towns and Cities of Castile-La Mancha	772	1,914,382
Udalsarea 21 – Basque Network of Municipalities for Sustainability	199	1,989,703
Network of Towns and Cities for Sustainability (Provincial Council of Barcelona)	253	577,3950
Network of Valencian Municipalities for Sustainability	217	2,402,842
Balearic Islands Sustainability Network	67	1,095,426
Provincial Network of Sustainable Towns and Cities (Huelva)	79	483,792
Provincial Network of Sustainable Municipalities (Jaen)	92	656,790
AL 21 (Cordoba)	74	796,159
Rete 21 (Huesca)	30	155,724
Navarre Network of Local Authorities for Sustainability	161	274,202
Cantabrian Local Sustainability Network	91	577,819
CILMA (Girona)	187	680,094
Alicante Natura – Provincial Agenda 21 Network	76	814,457
Provincial Network of Sustainable Municipalities (Saragossa)	114	155,045
Redmur21 – Network of Sustainable Municipalities of Murcia	40	1,342,879
Red GRAMAS – Network of Municipalities for Sustainability (Granada)	46	347,128
TOTAL	2,706*	26,059,727

Note: Some municipalities belonging to the Ciudad 21 Environmental Sustainability Programme – Andalusia are also registered with one of the provincial networks (Huelva, Jaen, and Cordoba). This factor has been taken into account when calculating the number of municipalities and people belonging to the network and the corresponding deductions have been made. The data for RedMur21 and Alicante Natura refer to 2008.

The Spanish Network of Cities for Climate focuses on leading local policy to combat climate change. The Network was created by the institutional Partnership Agreement signed with the Spanish Federation of Municipalities and Provinces (FEMP) on 4 November 2004. The overall objective of this Agreement was to create a framework to define implementation of actions and initiatives to prevent pollution and combat climate change in the context of local sustainability. The Network covers approximately 27.3 million people. A total of 279 municipalities are registered with it directly, while others belong to it through supra-municipal authorities.

The above-mentioned Agreement establishes the actions to carry out to promote sustainability policies in Spanish towns and cities in order to promote local policies to reduce greenhouse gas emissions. The aim is to provide municipalities with technical support and to monitor and assess the actions implemented within the

Network's framework. This initiative is closely tied to implementation of Local Agenda 21 programmes, which seek to foster inter-authority co-operation and co-ordination with the aim of establishing the mechanisms and actions needed to achieve the sustainability goals proposed at Rio 92.

NOTES

- According to the information gathered to date (2009) by the National Focal Point of the EIONET (pending the data for Andalusia, Extremadura, Castile-Leon and Murcia), Local Agenda 21 has been adopted in 1,751 municipalities — 628 have completed the preliminary diagnosis stage, 911 are implementing the Action Plan, and 381 have drawn one up but have yet to ratify it.
- The supra-municipal authorities affiliated to the Network of Cities for Climate, according to data provided by the FEMP, are listed in the table below. The population data refers to municipalities that are not directly affiliated to the Network, but that are registered through a supra-municipal authority. The Provincial Council of Barcelona is affiliated through the Network of Towns and Cities for Sustainability.

SUPRA-MUNICIPAL AUTHORITIES AFFILIATED TO THE NETWORK OF CITIES FOR CLIMATE (2009)

Authority	Population
Island Council of La Gomera	22,622
Autonomous City of Ceuta	77,389
Island Council of Ibiza	66,283
Island Council of Menorca	34,834
Provincial Council of Barcelona	2,315,224
Provincial Council of Cadiz	448,148
Provincial Council of Castellon	315,878
Provincial Council of Huelva	375,147
Provincial Council of Jaen	488,604
Provincial Council of Ourense	208,319
Association of Sustainable Municipalities of Cantabria	103,186
"Terra de Celanova" Association of Local Authorities	16,858
TOTAL	4,449,968

SOURCES

- Barcelona Urban Ecology Agency.
- MARM. Sub-Directorate General for Air Quality and the Industrial Environment. Urban Environment Department.
- Spanish Federation of Municipalities and Provinces (FEMP). Office for Co-ordination of Territorial Action and Sustainable Development.

FURTHER INFORMATION

- [http:// www.redciudadesclima.es](http://www.redciudadesclima.es)
- <http:// www.ecourbano.es> (includes links to all the authorities in the Network of Sustainable Local Development Networks)