

Policy priority objectives: comparative assessment in four European cities

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ABSTRACT

Sustainability must be an urban issue. Cities should be managed so as to minimize their impacts on environment, but providing an appropriate framework for economic and social development. However, European cities are facing some trends that threaten sustainable development. The aim of the EC research project INSIGHT-7FP (2013/16) is to develop appropriate management tools that can help to achieve sustainability in the context of European cities. In the project, a set of policy objectives have been designed for the management of urban areas, in order to face the main threats existing over cities. The paper presents a methodology based on indicators for analysing the progress towards these ten policy objectives in the four EU cities participating in the project: London (12.3 mill. inhab.), Madrid (6.4 mill. inhab.), Barcelona (5.4 mill. inhab.) and Rotterdam (1.4 mill. inhab.). All the indicators used in the analysis have been validated by ten policy makers of European cities. These policy makers participated on the stakeholders consultation carried out in the project, where the importance of the policy objectives proposed was also assessed. The paper concludes determining the policy priority objectives in each city, in order to contain the main threats existing over them: London should especially address the threats of social exclusion and transport inefficiency; Madrid the threats of economic decline and urban sprawl; Barcelona the economic decline and Rotterdam the contribution to climate change and the urban sprawl. Finally, the role played by the land use and transport system in these policy objectives is analysed. To this end, the assessment allows for the comparability of the results in a horizontal manner, in the basis of common indicators. Nearly half of these indicators are related to the land use and transport system of the cities.

GLOSSARY OF TERMS

GGE: Greenhouse Gases Emissions (CO₂ equivalent)

Metropolitan Area: geographical area where there is a high degree of interaction between its urban centres in terms of trips, relationships or economic activity

Central City: core city in the metropolitan area

Metropolitan Ring: Metropolitan area excluding Central City

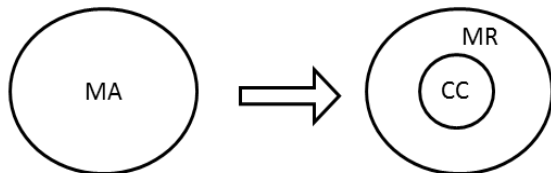


Fig. 1. Scheme of the components of a city. MA includes CC and MR

1. INTRODUCTION AND BACKGROUND

Sustainability must be an urban issue (Newman and Kenworthy, 1999). Cities should be managed so as to minimize their impacts on environment, but providing an appropriate framework for economic and social development (United Nations, 1972). In Europe, over 60% of the population lives in cities, where a bit less than 85% of the EU's GDP is generated (European Commission, 2007). Urban areas play a key role in the development of European territories. However, European cities are nowadays facing some trends that threaten sustainable development (European Union, 2011). "The aim of the research project INSIGHT-7 FP (2015) is to develop appropriate management tools that can help to achieve sustainability in the context of European cities". In the project, ten sustainability objectives have been designed for the management of urban areas, in order to face the main threats over cities (Romanillos et al., 2014). This paper presents a methodology based on indicators for analysing the progress towards the objectives designed. Indicators are considered to be appropriated tools to analyse the many overlapping areas of sustainability (Newman and Kenworthy, 1999), and many authors have already applied them to cities for this very purpose (Tanguay, 2010; Haghshenas and Vaziri., 2012; Alonso et al., 2015). All the indicators used in the analysis have been validated by ten policy makers of European cities. These policy makers participated on the stakeholders consultation carried out in the project (García et al., 2014). The methodology developed is applied to the cities of London, Madrid, Barcelona and Rotterdam, which are the four case studies of the project. The progress towards the objectives in each case is comparatively analysed. Finally, the role played by urban transport management in the progress or deviation from the objectives is showed.

The paper aims to develop a methodology to analyse if we are achieving the objectives in city management, specifically the sustainability objectives proposed. This will allow

prioritizing the objectives and the policies to be implemented, including transport management policies. The paper is structured in five sections. Section 2 details framework and methods used for the analysis. Section 3 presents the results. Section 5 then concludes, summarising the key findings that can be useful for future policy and research.

2. FRAMEWORK AND METHODOLOGY

This section explains the theoretical framework developed in INSIGHT, which has set the basis of the analysis, and introduces the case study application. Finally, the section details the methods used to get the results.

2.1 Theoretical framework for urban planning in European cities- setting the objectives

The first step of INSIGHT project was to study the main trends that threaten sustainability in European cities, in order to design appropriate objectives and policies for city management. For this, we recurred to the main reference document on urban problems at European level, which comes from the initiative Cities of Tomorrow (European Union, 2011). Considering sustainable development as a concept divided into three dimensions: society, environment and economy (OECD, 2002; Tanguay et al., 2010; Haghshenas and Vaziri, 2012), the main trends existing in European cities and threatening each dimension are described below:

Society: the weight of working-age population is decreasing due to the low birth rate, the increase in life expectancy and the migration of active population due to the lack of job opportunities. In addition, the socio-spatial segregation is growing, associated to socio-economic inequalities. Urban transport systems are related to this trend, since they affect the livability of cities and provide accessibility (a concept linked to equity).

Environment: the endless consumption of natural resources during urban growth and sprawl continues to pose a threat to the environment. This negative impact of urban development must be addressed to contain the resulting environmental damage.

Economy: a lot of problems associated with economic sustainability started appearing with the Eurozone crisis. The recent recession has been putting pressure over economic development and competitiveness.

Finally, urban sprawl witnessed by Europe in the latest decades has adversely impacted society, environment and economic efficiency (European Environment Agency, 2006). Therefore, sprawling can be considered as a horizontal threat to sustainability, based on the aforementioned dimensions. Despite the classification, the threats described under each dimension are interrelated.

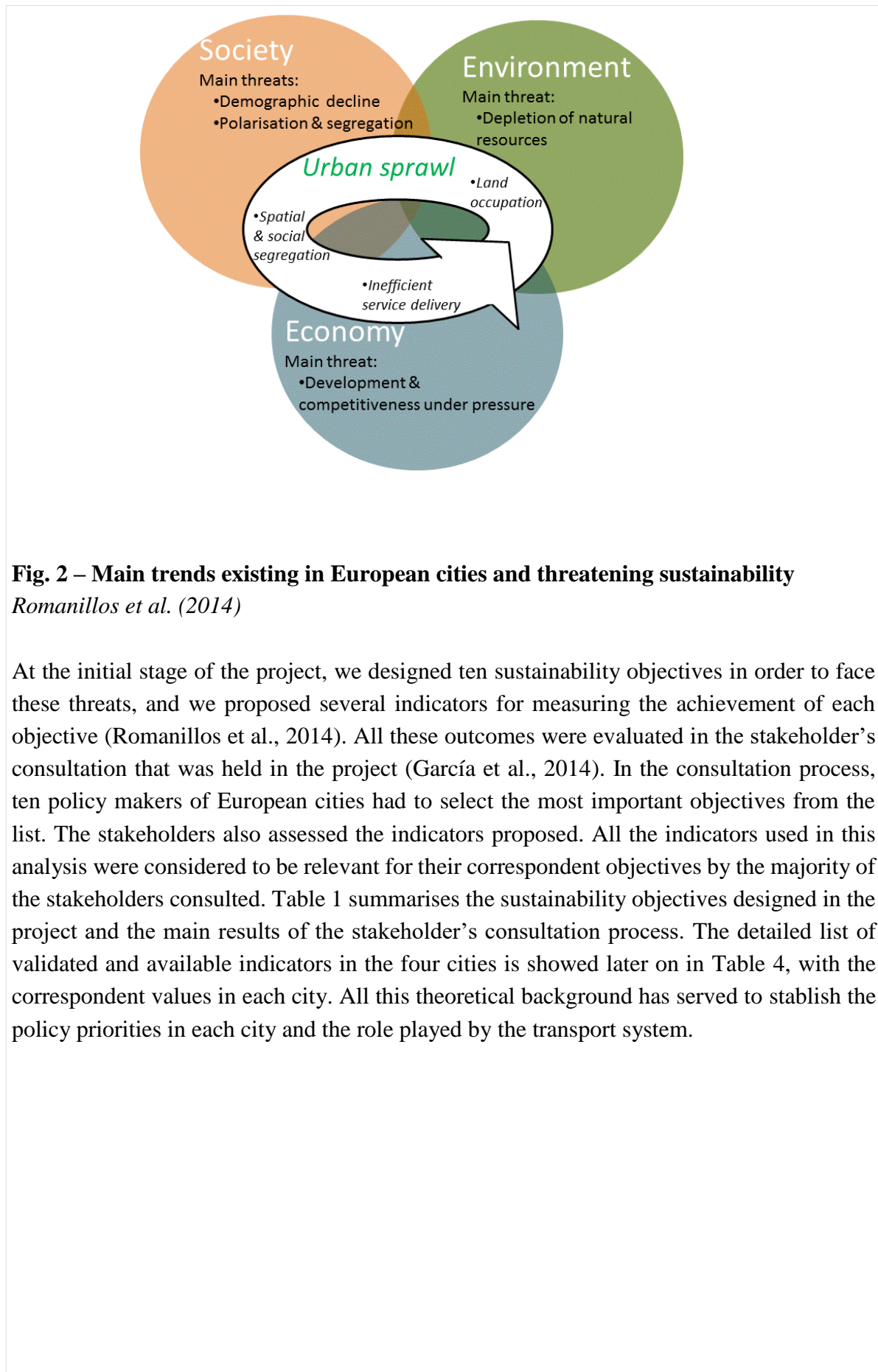


Fig. 2 – Main trends existing in European cities and threatening sustainability
Romanillos et al. (2014)

At the initial stage of the project, we designed ten sustainability objectives in order to face these threats, and we proposed several indicators for measuring the achievement of each objective (Romanillos et al., 2014). All these outcomes were evaluated in the stakeholder's consultation that was held in the project (García et al., 2014). In the consultation process, ten policy makers of European cities had to select the most important objectives from the list. The stakeholders also assessed the indicators proposed. All the indicators used in this analysis were considered to be relevant for their correspondent objectives by the majority of the stakeholders consulted. Table 1 summarises the sustainability objectives designed in the project and the main results of the stakeholder's consultation process. The detailed list of validated and available indicators in the four cities is showed later on in Table 4, with the correspondent values in each city. All this theoretical background has served to establish the policy priorities in each city and the role played by the transport system.

| Sustainability objective <i>Designed after a literature review about the main problems existing in cities</i> | Importance according to policy makers <i>Asked to select 2-3 objectives</i> | No. validated indicators <i>Considered relevant for the objective by the majority of stakeholders (at least by 5 of 10 stakeholders)</i> |
|---|---|--|
| Economic growth | Essential <i>(selected by 6 of 10 stakeholders)</i> | 5 |
| Economic efficiency | Little importance <i>(selected by 2 of 10 stakeholders)</i> | 3 |
| Liveable streets and neighbourhoods | Very important <i>(selected by 5 of 10 stakeholders)</i> | 5 |
| Equal, safe and secure society | Neutral <i>(selected by 3 of 10 stakeholders)</i> | 11 |
| Stop demographic decline | Unimportant <i>(selected by 0 of 10 stakeholders)</i> | 4 |
| Reduce contribution to climate change | Important <i>(selected by 4 of 10 stakeholders)</i> | 3 |
| Reduce pollution | Very important <i>(selected by 5 of 10 stakeholders)</i> | 6 |
| Reduce urban sprawl | Important <i>(selected by 4 of 10 stakeholders)</i> | 3 |

Table 1 – Sustainability objectives for EU cities. Summary of the policy makers’ assessment

Compiled by authors from Romanillos et al. (2014) and García et al. (2014)

Table 1 shows the importance attached to the objectives by policy makers. The main objective for most of them resulted to be the economic growth. This concern was especially influenced by the economic crisis, which began to hit the global economy in the summer of 2007 (Directorate- General for Economic and Financial Affairs of the European Commission, 2009). It is noted that more than two thirds of the European Union’s workforce live in cities (European Union, 2011). Many of these cities are now exhibiting a dual personality of economic strength co-existing with weak demand and unemployment (Campbell et al. 2013). Unemployment reduction is a top priority across European cities, since the beginning of the European recession which has caused a large drop in economic activity in the EU, with millions of jobs lost (European Commission, 2012).

Environmental objectives were also considered of high importance. The concern about damages of urban development to natural resources is not new. Environmental sustainability objectives such as stop contribution to climate change or reduce pollution are probably the most classical policy objectives in this comparative (European Union, 2011). In fact, most stakeholders declared their commitment with these problems.

The objective of economic efficiency as well as other social objectives such as equity and to stop demographic decline were of lower priority.

2.1 Case studies

The four European cities involved in INSIGHT project are from three different countries, presenting heterogeneous characteristics and sizes (Fig. 3 and Table 2). There are two capital cities, London (England) and Madrid (Spain), both accounting for a significant percentage

of their countries (19 and 14 % respectively) (EUROSTAT- General Statistics). However, their sizes are very different; the population of London (12 million inhab.) nearly doubles the population of Madrid (6 million inhab.). The city of Barcelona (Spain) is very similar to Madrid in size and relevance for the country. Rotterdam with 1.4 million inhabitants is the smallest in this comparative, accounting for a 8 % of the population in Netherlands. Geographically, we have two cities from Southern Europe and two from Northern Europe. This will make differences in the results since the recent economic crisis has especially impacted Southern cities (European Union, 2011).

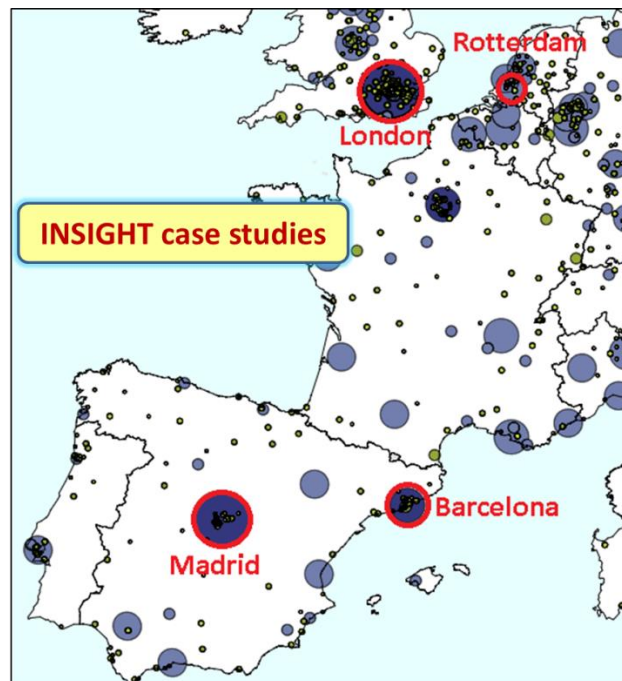


Fig. 3 – INSIGHT case studies represented in a map of EU cities illustrated by population

By authors from EUROSTAT Geographical information

| VALIDATED INDICATORS | Unit | London | | Madrid | | Barcelona | | Rotterdam | |
|----------------------------------|--------------------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|
| | | Central City | Metrop . Area | Central City | Metrop . Area | Central City | Metrop . Area | Central City | Metrop . Area |
| Population | M. Inhab. | 8.4 | 12.3 | 3.2 | 6.4 | 1.6 | 5.4 | 0.6 | 1.4 |
| Administrative Area | Km ² | 1,595 | 12,091 | 606 | 7,961 | 98 | 7,716 | 208 | 1,243 |
| Population density (Theoretical) | Inhab. / km ² | 5,243 | 1,021 | 5,292 | 825 | 700 | 634 | 2,963 | 1,124 |

Table 2 – General characteristics of INSIGHT case studies. Reference year: 2013

3. METHODOLOGY AND RESULTS

In this section we present the methodology used to determine the priority policy objectives in each city, followed by the results, which are summarized in tables. The set of indicators allow analysing the present state of the objectives on a comparative basis, by looking at their actual values (2013) in the four cities. Moreover, by looking at the annual growths of the

indicators along the years, we can measure the evolution (2007-2013) of the objectives in each city. This paper considers these concepts and establishes the priorities having also into account the stakeholders' assessment. Finally, we analyse the role played by the land use and transport system in these policy objectives. The stages followed for this analysis have been:

- Set the theoretical framework, and support it by stakeholders' assessment (Table 1). This framework consists on a series of sustainability objectives to address the threats over cities, and indicators to measure them.
- Collection of the indicators from European and other international databases¹, where the data for the four cities was available. The year of reference for the comparison among cities was the 2013. The period of reference for analysing the evolution in each city was 2007-2013 (Table 3)
- Comparison of the values of the indicators in the four cities for the year 2013 (Table 4). This comparison leads to analyse the most negative values considering their related objectives and some practical considerations (Table 4, indicators in red). The practical considerations are necessary since some indicators have resulted unappropriated for measuring their related objectives.
- Calculation of the annual growth rates of the indicators (Table 5). In order to prioritize the objectives, we need to measure the importance of the correspondent threat, and this means measuring evolution. This rates lead to analyse again the most negative values on a comparative basis, this time regarding evolution (Table 5, indicators in red)
- Qualitative analysis to establish the policy priorities (Table 6). This analysis considers the values of the indicators for the year 2013 as well as the evolution of the indicators during the period 2007-2013 and the policy makers' assessment.
- Policy priorities: the most important policy sustainability objectives in each city (Table 7). These priorities have been established on a comparative basis and have considered the magnitude of the trends threatening the cities. In this stage we analyse from a theoretical point of view the possible land use and transport strategies that could help to achieve the policy priorities.

| Sustainability objective | No. validated indicators | No. indicators available for the four cities <i>Reference year: 2013</i> | No. of indicators available for analysing evolution in the four cities <i>Reference period: 2007-2013</i> |
|---------------------------------------|--------------------------|---|--|
| Economic growth | 5 | 3 | 3 |
| Economic efficiency | 3 | 3 | 2 |
| Liveable streets and neighbourhoods | 5 | 3 | 3 |
| Equal, safe and secure society | 11 | 3 | 1 |
| Stop demographic decline | 4 | 1 | 1 |
| Reduce contribution to climate change | 3 | 3 | 1 |
| Reduce pollution | 6 | 2 | 2 |
| Reduce urban sprawl | 3 | 3 | 1 |

Table 3 – Collection of indicators for the year 2013 and for the hole period 2007-2013

¹ OECD- Metropolitan Areas Aatabase, EUROSTAT- Regional Statistics, EUROSTAT- Urban Audit, EMTA Barometer, INRIX

| Obj. | Indicators (Sign) | Unit | London | | Madrid | | Barcelona | | Rotterdam | |
|---------------------------------------|--|-------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | | | Cent. City | Met.. Area | Cent. City | Met.. Area | Cent. City | Met.. Area | Cent. City | Met.. Area |
| Economic Growth | GDP per capita (+) | €/inhab. | 55,598 | | 31,004 | | 29,671 | | 36,500 | |
| | Employment rates of the working population (+) | % | 70.6 | | 59.0 | | 57.3 | | 71.8 | |
| | Land price (+) | €/m ² | 10.70 0 | 5.600 | 2.200 | | 2.400 | | 1,600 | |
| Economic Efficiency | Unoccupied dwellings (-) | % | 2.0 | 2.3 | 11.6 | 9.3 | 12.9 | 10.2 | 9.3 | 6.1 |
| | Average time lost in congestion per driver (-) | Hours/driver | 101 | | 22 | | 28 | | 46 | |
| | Labour productivity (added value per worker) (+) | €/employ- yed | 78,366 | | 69,401 | | 67,048 | | 63,079 | |
| Liveable and secure streets | Green space per capita (+) | m ² / inhab. | 37.9 | | 27.4 | | 2.5 | | 72.4 | |
| | No fatalities per 10,000 inhab. (-) | Ratio | 0.183 | | 0.159 | | 0.317 | | 0.178 | |
| | Exposure of the population to air pollutants (-) | µg/m ³ | 10.3 | | 10.9 | | 11.1 | | 17.1 | |
| Equity | PT supply : (+) Bus | Veh-km / inhab. | 58.3 | | 41.4 | | 25.8 | | 13.3 | |
| | Metro | | 9.0 | | 2.0 | | 4.0 | | 7.5 | |
| | Tram | | 0.3 | | 4.9 | | 0.5 | | 5.6 | |
| | Train | | - | | 5.4 | | 6.9 | | - | |
| | TOT | | 67.6 | | 53.7 | | 37.2 | | 26.4 | |
| | Income inequality GINI index (-) | Ratio | 0.555 | | 0.439 | | 0.462 | | 0.414 | |
| People at risk of social exclusion(-) | % | 24.8 | | 19.2 | | 21.8 | | 14.2 | | |
| Demog. Decline | Share of population over 65 years(-) | % | 11.5 | 13.5 | 20.2 | 16.1 | 21.4 | 17.9 | 14.5 | 16.4 |
| Stop Climate Change | GGE emissions per capita (-) | Tonnes/inhab. | 7.9 | | 7.1 | | 5.7 | | 16.4 | |
| | GGE emissions by sector: Transport | % | 31.2 | | 43.6 | | 39.4 | | 43.1 | |
| | Industry | | 10.8 | | 1.9 | | 7.4 | | 11.4 | |
| Reduce Pollut. | Air pollutants concentration(-): NO ₂ | µg/m ³ | 36.7 | | 30.3 | | 31.8 | | 30.6 | |
| | PM ₁₀ | | 18.5 | | 17.7 | | 21.6 | | 21.0 | |
| Reduce Sprawl | Urbanised surface (-) | Km ² | 1,042 | | 1,043 | | 607 | | 440 | |
| | Population density (in urbanised surface) (-) | Inhab/km ² | 8,077 | | 6,228 | | 8,305 | | 5,114 | |
| | Share of the metropolitan area population living in the city | % | 60.3 | | 50.0 | | 29.6 | | 42.8 | |

Table 4 – Values of the indicators associated to the objectives. Year 2013

(Sign) (+) if a higher value of the indicator is positive for the achievement of the objective and (-) is the opposite

Red colour: Indicators with the most negative values for their related objectives on a comparative basis

Grey cells: Transport and land use indicators

| Annual growth rates 2007-2013 (%) | | | | | | | | | | |
|-----------------------------------|--|------|------------|------------|------------|------------|------------|------------|------------|------------|
| Obj. | Indicators (Sign) | Unit | London | | Madrid | | Barcelona | | Rotterdam | |
| | | | Cent. City | Met.. Area | Cent. City | Met.. Area | Cent. City | Met.. Area | Cent. City | Met.. Area |
| | Population | | 1.5 | 1.3 | -0.7 | 0.2 | -0.2 | 0.1 | 0.0 | 0.7 |
| Economic Growth | GDP per capita (+) | | 0.0 | | -1.6 | | -2.1 | | -2.3 | |
| | Employment rates of the working population (+) | | 0.0 | | -3.2 | | -3.5 | | -0.8 | |
| | Land price (+) | | 8.8 | 0.9 | -10.4 | | -11.1 | | -3.7 | |
| Economic Efficiency | Average time lost in congestion per driver (-) | | 17.4 | | -11.2 | | -9.0 | | -3.6 | |
| | Labour productivity (added value per worker) (+) | | -0.1 | | 2.0 | | 3.2 | | -2.3 | |
| Liveable and secure streets | Green space per capita | | -1.2 | | -1.9 | | -1.1 | | 0.4 | |
| | No fatalities per 10,000 inhab. (-) | | -10.5 | | -9.3 | | 2.5 | | -10.0 | |
| | Exposure of the population to air pollutants (-) | | -3.8 | | -1.4 | | -1.9 | | -1.2 | |
| Equity | People at risk of social exclusion (-) | % | 1.4 | | 2.9 | | 4.1 | | -1.0 | |
| Demog. Decline | Share of population over 65 years (-) | | 1.2 | 1.8 | 2.5 | 3.7 | 1.3 | 2.0 | 1.2 | 2.9 |
| Stop Climate Change | GGE emissions per capita (-) | | -2.0 | | -2.6 | | -2.7 | | -1.0 | |
| Reduce Pollution | Air pollutants concentration: (-) | | | | | | | | | |
| | NO ₂ | | -2.0 | | -4.5 | | -4.4 | | -3.0 | |
| | PM ₁₀ | | -5.2 | | -5.6 | | -6.9 | | -6.3 | |
| Reduce Sprawl | Share of the metropolitan area population living in the city (-) | | 0.2 | | -0.9 | | -0.2 | | -0.4 | |

Table 5 – Annual growth rates of the indicators associated to the objectives. Period 2007-2013

Sign (+) if a growth in the value of the indicator is positive for the achievement of the objective and (-) is the opposite

Red colour: Indicators whose evolution very negative for their related objectives on a comparative basis

Grey cells: Transport and land use indicators

| | London | Madrid | Barcelona | Rotterdam |
|---------------------|---|--|---|--|
| Economic Growth | London presents the highest GDP per capita in 2013 and especially the highest land prices. Is the only city in this comparative that does not present a negative evolution of economic indicators during the EU economic recession (2007-2013). The land prices have even grown in this period (this may indicate economic growth, but it is probably negative for the objective of equity since affects the costs of living). | Both Spanish cities present the lowest GDP per capita and employment rates. Moreover, all their economic indicators have deteriorated significantly during the crisis period. The land prices have dropped an average of 10-11 % per year. Employment rates have declined by a 3 % per year. This negative evolution is of especial concern since it is related to other threats such as demographic decline and social exclusion and polarisation. | | Rotterdam presents the highest employment rate. The land prices are the lowest in this comparative, but this is not significant since the land prices decrease with city sizes (Quigley, 1998). The economic indicators present deterioration during the generalised EU recession but much less marked than in Madrid and Barcelona. |
| Economic Efficiency | Only congestion seems to be a great and growing problem for efficiency in London. However, congestion affects to the energy use, noise, pollution and emissions. Therefore we are going to consider the congestion reduction as priority for the case of London. | Madrid and Barcelona behave very similarly in economic terms. Regarding economic efficiency indicators: - The rate of empty dwellings is high, especially in the central cities. This is an effect associated to the gentrification (unaffordable prices in city centres) that make the population move to the periphery) (Cameron, 2003), and is a reflection of the urban sprawl. - The labour productivity has increased in the recession period (less workers but more productive) - The congestion levels are quite good compared to London and Rotterdam and the evolution is positive. Probably associated to the slowdown of activities that leads to a reduction of transport demand and traffic levels (Preston and Rajé, 2007) | | Rotterdam presents the highest labour productivity loses in this comparative. Unlike in the Spanish case studies, the GDP of Rotterdam has fallen below the employment rates, reducing the added value created per worker. Congestion in Rotterdam is high for the size of the city. |
| Liveab | The green space, exposure to pollution and accident rates in London present quite good values for being such a big city. In addition, the evolution is in general positive. | Madrid presents the lowest rate of fatalities per capita in this comparative | Barcelona presents the lowest green space per capita and the highest number of fatalities per capita. Moreover, these last are growing. | Rotterdam accounts for a lot of green space per capita, although its population is highly exposed to pollution. |
| Equity | The inequality index and the level of social exclusion are very high in London compared to the rest of the cases. Therefore we are going to consider Equity as a priority for this case. Improving PT services helps to improve equity and inclusion by improving accessibility. The PT supply of London results to be the highest one, but this is not necessarily significant since the indicator is too dependent on the city size (Alonso et al., 2014) | The percentage of people at risk of social exclusion has grown in both Spanish cities in the period 2007-2008, although more in Barcelona than in Madrid. This is related to the economic decline and job losses. | | Unlike in the case of London, the equity and social inclusion levels in Rotterdam are the best in this comparative. The PT supply is relatively small; this is not surprising, since this indicator is very dependent on the city size (Alonso et al., 2014). |
| Dem | The ageing of the population is a trend happening in the four case studies, while it is not a priority for policy makers. We can observe that in all cities except for London, the average age in the periphery is lower than in central cities. This is associated to the gentrification, which makes young families look for affordable houses in the periphery, and is one of the causes of urban sprawl (European Environment Agency, 2006). The percentage of people over 65 years is higher in Madrid and Barcelona and London has the youngest population. | | | |
| GGE poll. | The GGE per capita and the pollution levels have reduced in the four cities, probably helped by the slowdown in activities but also due to the stakeholders commitment with environmental problems in general (Alonso and Monzón, 2016). However, Rotterdam has an especially high level of GGE emissions per capita and as this is considered to be an important issue for policy makers we are going to consider it as a policy priority. | | | |

| | | | | |
|---------------|--|--|--|--|
| Reduce Sprawl | <p>The urban sprawl in London does not seem to be a great concern compared to the other case studies. The land occupation (urbanised surface) is not big for the size of the city, and the density is high. Moreover, it is the only city where the percentage of population living in the central city has not decreased.</p> | <p>Madrid has a widely dispersed urban population, and presents the biggest land occupation in this comparative. In addition, the population movements to the metropolitan ring are very significant. During the period 2007-2013 the central city has been constantly losing population weight. Therefore this is a priority concern in the city of Madrid.</p> | <p>Barcelona presents most dense urban population in this comparative. The percentage of people living in the central city is low, but this is due to the administrative organization of the city. However, this percentage has not decreased as much as in Rotterdam or Madrid.</p> | <p>Rotterdam accounts for the most dispersed urban population. Moreover, as has occurred in Madrid, the central city has been constantly losing population weight over the whole metropolitan area. Therefore this is a priority concern in the city of Rotterdam.</p> |
|---------------|--|--|--|--|

Table 6 – Qualitative analysis considering values from Tables 4 and 5 and the policy makers’ assessment (Table 1)

| | London | Madrid | Barcelona | Rotterdam |
|------------------------------------|--|--|--|--|
| Policy priorities | <ul style="list-style-type: none"> - Reduce congestion to increase efficiency - Equal society and avoid social exclusion | <ul style="list-style-type: none"> - Economic growth - Reduce/ Stop urban sprawl | <ul style="list-style-type: none"> - Economic growth - Increase liveability equity and security | <ul style="list-style-type: none"> - Reduce GGE emissions, and pollution exposure - Reduce/ Stop urban sprawl |
| Relation to land use and transport | <p>- The congestion is a problem directly related to the land use and transport system, which creates economic inefficiencies and environmental problems. It is due to excessive car use and it can be solved by improving PT services, enhancing soft modes or pricing measures (European Commission, 2007)</p> <p>-The social exclusion is partially related to the segregation of residential zones according to income, and exacerbates social and economic divisions, enhancing inequality. The process usually leads to a growing degradation of the poorest areas, whose residents may be socially excluded due to the lack of accessibility to basic needs, jobs or activities (Preston and Raje, 2007). Some urban planning strategies can partly address this problem. Examples of these strategies are the promotion of tenure mix in housing or the improvement of accessibility levels - by improving PT or making it more affordable to access to these needs (Coline et al., 2013).</p> | <p>- Economic growth and job creation depend on demand, and cities can stimulate demand in many ways. In this regard, land use and transport management could help in some way to create a business-friendly environment, by providing good accessibility, competent transport networks or even liveable neighbourhoods (Campbell et al., 2013). These conditions can attract both businesses and people.</p> <p>- Urban sprawl is clearly a land use and transport issue, defined as the spread of low-density settlements, and considered as one of the main challenges that cities face (European Union, 2011). This threat can be addressed through higher density developments with good public transport connections, but also by preventing migration to peri-urban areas- improving inner city spaces in order to create more liveable and attractive environments or promoting housing mix to avoid gentrification.</p> | <p>- A liveable, equal and secure city accounts for good physical and social environments (Scappa and Neil, 2013). Therefore, land use and transport strategies such as the increase of green areas and public spaces, the improvement of public services or the reduction of space dedicated to traffic and the enlargement of areas dedicated to pedestrians and bicycles can help to improve liveability, equity and security</p> | <p>- Urban areas consume more than two thirds of the total energy in EU, mainly due to building and transport sectors (UN-HABITAT, 2009). In addition, most of the energy sources are not renewable, and are responsible for air pollution and GGE. Especially in the transport sector where the strong dependence on cars and therefore on fuel cause also air pollution and noise (Enemark and Kneeshaw, 2013). In the case of Rotterdam a 43% of GGE come from the transport sector. Urban strategies designed to avoid sprawl, would help to reduce the environmental impact, since the density of urban areas allows for more energy efficient forms of housing, transport and service provision (European Union, 2011). On response to car dependence, policies such as integrated land use planning, improvement of public transport networks, car restrictions or expansion of infrastructures for pedestrians and cyclists are recommended (European Commission, 2007).</p> |

Table 7 – Policy priorities: the most important policy sustainability objectives in each city. Role of land use and transport strategies

4. CONCLUSIONS

European cities need to be sustainable, since they are the drivers of economic development and deliver many public services, such as education, healthcare and transportation (European Union, 2011). However, urban areas in Europe are facing some trends that have become real threats to their sustainable development. In this paper we present a set of policy objectives, which have been designed for the management of urban areas, in order to face the main threats existing over cities. The objectives have undergone a stakeholder's assessment: ten policy makers from European cities have evaluated them in terms of importance and have validated a series of indicators related to them. This framework has been used to evaluate the policy priorities of four European cities: London, Madrid, Barcelona and Rotterdam. By comparing the values of the indicators in each city for the year 2013 and measuring the evolution of the indicators during the period 2007-2013, we have determined the most important objectives for each city. The priority objectives will respond to the weakness or main threats of the cities: Madrid and Barcelona should especially address the threat of economic decline, Rotterdam the sprawl and London the social exclusion.

Finally, the role played by the land use and transport system in these policy objectives is analysed. This analysis is partially supported by the indicators used, half of which are related to the land use and transport system of the cities. Land use and transport strategies reducing congestion help to achieve economic efficiency, as well as policies enhancing PT and soft modes help to reduce exclusion, liveability or even sprawl.

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Regional Statistics

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Urban Audit

<http://ec.europa.eu/eurostat/web/cities/data/database>

INRIX Traffic Score Card

<http://inrix.com/scorecard/>

OCDE- Metropolitan Areas Database

<http://stats.oecd.org/Index.aspx?Datasetcode=CITIES>

