



Innovative
Policy Modelling and Governance Tools
for Sustainable Post-Crisis Urban Development

D2.1 Stakeholder Consultation Report

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Executive Summary

This report presents the results of the stakeholder consultation on urban planning practices and urban modelling tools carried out by the INSIGHT project in different European cities. The results include the feedback of 10 policy makers from 10 cities in 9 different countries and 18 modellers and technicians from 13 cities in 11 different countries.

From the objectives declared by the different cities, we observe an interest in balancing the three dimensions of sustainable urban development: social, economic and environmental. The most widespread economic objectives are to increase competitiveness in the global economy and to promote economic diversity at the local level. Within the social dimension, the most widespread objectives are to improve the liveability of streets and neighbourhoods and to boost innovation, development of new technologies and job creation. The environmental objective most commonly encountered across cities is the reduction of energy consumption.

Although there seem to be similarities between all respondents on the main objectives, significant differences are found when evaluating the relevance of performance indicators to measure the impact of policies. This makes us conclude that a standardised and agreed list of performance indicators would be helpful to enable a sound comparison across European cities. We can also observe that the measures taken by each city are quite diverse, reflecting the variety of problems encountered from city to city.

Urban development affects different stakeholders and involves a number of dependencies and trade-offs. More than 70% of the cities declare that coordination mechanisms across different departments and with other public administrations are in place, from informal daily interaction to formal coordination (e.g., through steering groups). Most cities also have mechanisms for stakeholder participation in the policy making process. Citizens associations, environmental associations and private companies are the groups most actively involved.

Regarding the use of urban models and other ICT tools in the policy cycle, according to policy makers they are mainly used for the evaluation of threats and opportunities, while the use of urban models for the evaluation of the potential impact of policies is very limited. The perception of modellers and technicians is somehow different: they consider that urban models are effectively used for decision making, but most of them find that the level collaboration between modellers and policy makers is insufficient. The most commonly used models are in house developed land use and land use-transport interaction (LUTI) models, travel demand models, GIS tools, and location-allocation models.

Policy makers and modellers have different viewpoints on the main areas of improvement of models and decision support tools: while more than 80% of the addressed policy makers think that the connection between models and real scenarios is the main area of improvement, more than 90% of the modellers consider that the main improvement area is the availability and accuracy of input data. This confirms the relevance of developing new techniques to collect, integrate and analyse data from different sources, which is one of the main objectives of the INSIGHT project. Another area where further progress is needed, also closely related to INSIGHT objectives, is the insufficient participation of stakeholders in the design and calibration of the models, which may affect the perception of final users about the relation between real scenarios and modelled scenarios and thus the credibility of the modelling results.

1. Introduction

This report presents the methodology and results of the INSIGHT Stakeholder Consultation. The consultation was designed as part of INSIGHT WP2 'Challenges for Urban Development and Governance - The role of ICT', with the aim to feed the rest of the activities in WP2 with an overview of the current European practices in urban planning and the experiences and needs of policy makers and other stakeholders regarding urban development policy assessment.

2. Design of the survey

2.1 Survey objectives

The survey was designed to complement the literature review conducted in WP2 with an empirical analysis of general practices in urban planning, cities' objectives and indicators, and the use of decision support tools in policy making, with the ultimate purpose of contributing to the general objectives of INSIGHT WP2:

- identify the most relevant policy questions in the field of European urban development, with particular attention to the recovery from the current economic crisis;
- define a set of urban development performance indicators that will frame the INSIGHT project to guide the rest of the project activities;
- review the current urban planning methodologies and ICT tools and analyse their capabilities, shortcomings and room for improvement, focusing on the four areas tackled by the project: data, theory, policy interfaces and organisational integration of model-based participatory planning;
- define the requirements, performance objectives and ex-post evaluation criteria for the methods and tools developed by INSIGHT.

In order to achieve such objectives, two different questionnaires have been designed:

- a questionnaire targeting policy makers, designed to identify:
 - cities' urban development objectives and indicators used to measure the progress towards these objectives;
 - current and future measures and policies planned by the cities;
 - collaboration with different stakeholders in decision making;
 - barriers and required improvements for the use of urban models in policy making.
- a second, more technical questionnaire targeted to technicians and modellers, designed to identify:
 - the types and characteristics of the urban models and ICT tools used by the cities;
 - the current measures and policies implemented into urban simulation models;
 - collaboration with different stakeholders in the building of urban models;
 - scientific/technical barriers and required improvements in current urban models.

Both questionnaires address the question of the collaboration between policy makers and modellers and technicians, with the purpose of identifying the gap between available models and tools and policy makers' needs.

2.2 Sample

One of the aims of INSIGHT as a European project is to provide evidence that empirical results based on a selection of local case study areas are relevant at the European level. With this goal in mind, the survey has been distributed to urban development policy makers and urban modellers/practitioners from 40 European cities.

2.2.1 Spatial typologies to set the framework of European research and policy making

The great diversity of spaces across Europe is an issue of growing concern for scientists and policy makers. The European Spatial Development Perspective (European Commission, 1999) alerted on the importance of safeguarding the diversity of European regions, and the third cohesion report (European Commission, 2004) evidenced that the application of universal policies did not satisfy the expected cohesion objectives. Eventually, this led to the inclusion of the territorial perspective in the cohesion agenda, which was endorsed in the Treaty of Lisbon (European Union, 2007) and further developed in the Territorial Agenda of the EU 2020 (European Union, 2011).

In order to account for European diversity, specifically targeted policies were claimed in lieu of one-size-fits-all policies. In this framework, spatial typologies become a useful tool to guide the development of targeted policies that focus on solving the main issues affecting each class of regions. For example, when dealing with rural areas, the EDORA project (ESPON, 2011) classified European rural regions according to their accessibility and socio-economic structure and performance. Similarly, the FOCl project (ESPON, 2010a) provides a variety of classifications of urban regions. Regions in each category face common challenges, and thus can benefit from similar policies. On the contrary, successful policies in one type of regions might not address the needs of regions in other categories.

The usefulness of spatial typologies is twofold, as it serves both to policy makers to search and share solutions that are easily transferable to areas of similar characteristics, and to researchers to set the framework and compare their results. This has led to the development of a large variety of typologies. The European Observatory for Territorial Development (ESPON) provides over 40 typologies of European regions according to demographic, social, economic, environmental, innovation and many other criteria (ESPON, 2010b).

The increasing number of spatial typologies resulted in an effort of synthesis in order to favour the use of previously developed typologies and avoid redundant efforts of researchers producing a specific typology for each research project. Ballas et al. (2003), Copus et al. (2008) or ENRD (2010) are good examples of compilations of spatial typologies in Europe. Also the ESPON website provides a typology compilation consisting on a selection of nine typologies covering a variety of criteria.

2.2.2 A spatial typology to assist the stakeholder consultation

The use of spatial typologies has been addressed in three steps and at two scales. First, a simple and commonly-used typology of countries has been selected in order to ensure that the survey respondents are representative of the variety of European countries. For this we have chosen the classification of the United Nations, which divides European countries in four groups (see map on Figure 1 and list of European countries on Table 1), to which we have also added Turkey as part of Southern Europe. Being a typology developed by a worldwide organisation, it ensures a quick and easy understanding of the commonalities and differences of each group of countries.

Table 1. Composition of macro geographical (continental) regions, geographical sub-regions and selected economic and other groupings (Source: UN, <http://unstats.un.org/unsd/methods/m49/m49regin.htm>)

Geographical Regions	Country
Northern Europe	Denmark, Finland, Sweden, Latvia, Lithuania, Estonia, United Kingdom
Southern Europe	Greece, Italy, Malta, Portugal, Cyprus, Spain, Croatia, Slovenia, Montenegro, Serbia, Albania, Turkey
Eastern Europe	Czech Republic, Hungary, Poland, Slovakia, Romania, Bulgaria, Ukraine, Belarus, Moldova, Russian Federation
Western Europe	Austria, Germany, France, Belgium, Luxemburg, Netherlands



Figure 1. United Nations geographical region and composition of Europe

In the second step we turn to the regional scale in order to identify groups of urban areas with similar characteristics to our case study areas. We choose the “Typology on metropolitan regions” included in the ESPON Typology Compilation, thus facilitating further comparisons with other European projects. It is a simple and well-known typology from which we can extract 175 EU metropolitan regions that, as our case study areas, are the capital or second-tier metropolitan areas of their respective countries¹ (see Annex II).

¹ The capital city region is the metro region which includes the national capital. Second-tier metro regions are the group of largest cities in the country excluding the capital. For this purpose, a natural break in the population rank of cities in each country served the purpose of distinguishing the second tier from the smaller metro regions. The population threshold

The objective of the third step is to establish a comparison framework between our case study areas and the final respondent metropolitan areas. The recent FOCI project (ESPON, 2010a) provides a multicriteria classification of metropolitan macroregions which will serve to identify to which degree INSIGHT results can be transferable to each respondent. We choose this typology because it focuses on metropolitan areas and it is based on a sound analysis of multiple variables that capture the complexity of classifying cities beyond simple population or economic threshold whilst using up-to-date data and offering a wide spatial coverage.

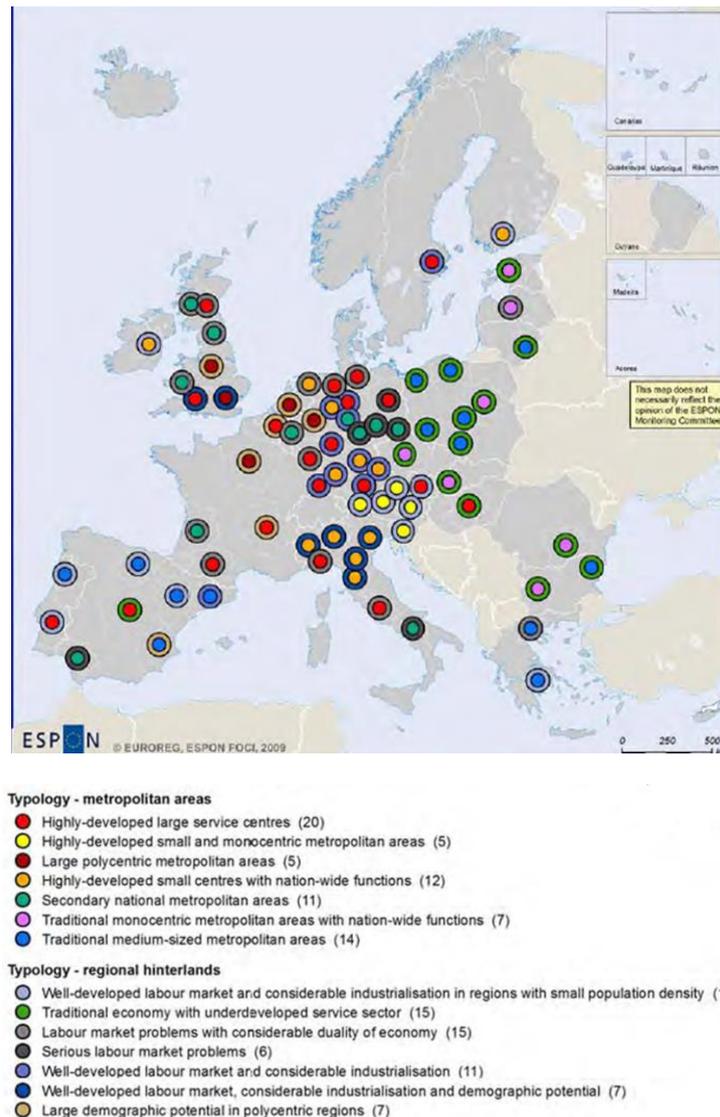


Figure 2. Typology of metropolitan macroregions. Source: ESPON (2010a)

between the second tier metro areas and smaller areas in each country was set by first ordering the cities by descending population, and then identifying the largest difference between the population of one city and the previous one. This is a common method when working with urban hierarchies of different countries, since the population of a large city in one country might be similar to the population of towns in another.

2.3 Structure of the questionnaires

The questionnaires were designed using the online platform Survey Monkey (www.surveymonkey.com), aiming to facilitate the collection and management of the responses. The tool allows the design of online questionnaires using a wide range of different types of questions.

The questionnaires were designed to be as short as possible and interesting for the respondents. Apart from the questions themselves, explanatory introductions and figures were provided to facilitate the interpretation of the questions, in order to obtain more accurate responses.

A list of preliminary questions was prepared by all members of INSIGHT WP2, in order to ensure that all topics and objectives were covered. This list of questions was integrated in a preliminary version of the survey which was tested and discussed with representatives of the Madrid City Council and other experts from the urban sector. A final version of the questionnaires was produced as the result of these meetings. The structure of the questionnaires is discussed below.

2.3.1 Policy makers' questionnaire

The policy makers' questionnaire was divided into 5 main sections containing the relevant questions of the survey and 3 sections concerned with additional information such as an introduction to the survey, contact details and acknowledgements.

Sections 1 to 5 comprise a total of 17 multiple option questions and 2 open questions. We have reduced to the minimum the number of open questions in order to expedite the questionnaire answering and results' analysis. However, the opportunity of adding an answer not appearing as an option in the questionnaire was given.

A brief description of each section is given below:

- 'Introduction': a brief introduction to the project and the objectives of the questionnaire is given. General information about the characteristics of the questionnaire, expected answering time and privacy issues are also included in this section.
- 'Contact details': this section asks for the contact details of the respondents, which are kept confidential.
- Section 1 'Sustainable urban development objectives': participants are asked about their city main objectives related to urban development and current urban planning activity.
- Section 2 'Indicators': the indicators considered in each city are identified in this section, as well as the documents where they can be found.
- Section 3 'Policies and measures': this section is intended to single out the main measures applied in order to accomplish city objectives.
- Section 4 'Governance and processes': questions about coordination between administrations and the relation with different stakeholders along the policy cycle are formulated in this section.
- Section 5 'Urban policy models and other decision support tools': this section is designed to assess the use of urban models and ICT tools in the process of policy making and urban planning, as well as to identify the main areas for improvement in relation to urban modelling and simulation.
- 'Acknowledgements': acknowledgements to all the participants in the consultation.

2.3.2 Modellers/technicians questionnaire

The modellers/technicians questionnaire was divided into 3 main sections containing all questions of the survey and 3 sections concerned with additional information similar to that of the policy makers' questionnaire.

Sections 1 to 3 include a total of 15 multiple option questions and 2 open questions. As in the policy makers' questionnaire, the option of adding an extra answer was given for some questions. The 'Introduction', 'Contact details' and 'Acknowledgements' sections are the same as those in the policy makers' questionnaire.

A brief description of the three main sections is given below:

- Section 1 'Affiliation, competences and responsibilities': participants are asked about the type of institution they work for and the main field in which the institution works. Questions about the relations with different types of institutions are also included.
- Section 2 'Governance and processes': questions about coordination between modellers and policy makers during the process of policy making are addressed in this section.
- Section 3 'Models and tools': technical aspects such as type of models, models characteristics and data requirements are addressed in this section.

2.4 Sending of the questionnaires

Four different channels were used to contact policy makers and urban modellers in different European cities.

The first channel consisted in personal emails to each of the experts. The name of the experts for those cities that are members of the Network of European Metropolitan Regions and areas (METREX) were obtained from the METREX website (<http://www.eurometrex.org>). The list accounts for 27 cities (see Annex II). Experts from other cities such as Rome and Rotterdam were identified thanks to personal links with members of the INSIGHT consortium. The experts contacted were also asked to forward the survey to possible interested experts in the same or in other cities.

The second channel was the INSIGHT Advisory Board, whose members were asked either to answer the questionnaire or to forward it to relevant experts they may know.

The third channel was the Council of European Municipalities and Regions (CEMR), which distributed the questionnaire among its members.

The last channel was the Nordic Centre of Spatial Development (Nordregio), which has also performed a similar survey, in order to distribute the questionnaire among the already identified experts from Nordic countries.

The sending process was divided into two rounds, the second one being mainly a reminder round addressed to those people who had not responded to the questionnaires in the first round.

3. Questionnaire results

3.1 Policy makers questionnaire results

3.1.1 Characterisation of the respondents

At the moment of writing this report, the questionnaire had been answered by policy makers from 10 cities in 9 different countries. Table 2 shows the list of the questionnaires obtained.

Table 2. List of cities participating in the policy makers' survey

Region	Country	City
Northern Europe	Sweden	Stockholm
	Denmark	Aarhus
	Norway	Oslo
Southern Europe	Spain	Madrid
		Barcelona
	Greece	Thessaloniki
	Italy	Bergamo
Western Europe	Austria	Vienna
	Belgium	Brussels
	Netherlands	Rotterdam

The amount of countries and cities per geographical region is balanced for Northern, Southern and Western Europe, but so far we have had no feedback from any country in Eastern Europe. The amount of cities per geographical region allows the observation of a number of interesting facts and trends, but it is not considered large enough to claim that the vast diversity of European cities is represented in the answers of the questionnaire.

Question 1: profile of the respondents

40% of the policy makers participating in the survey belong to the urban planning department of the city council, one of these being in charge of "smart city planning"; 10% belong to the environmental direction of the city council; and the remaining 50% did not specify the department to which they belong. 44% of the respondents defined themselves as advisers, 33% as urban planners and 22% as project managers.

3.1.2 Sustainable urban development objectives

Question 2. Has your city been recently (during the last 5 years) involved or is currently involved in any kind of urban planning activity?

Options	Percentage of responses	Number of responses
Yes	100%	10
No	0%	0

Question 3. What were/are the drivers for this? (Only if the previous answer was “Yes”)

Options	Percentage of responses	Number of responses
Legal requirement	60%	6
Other factors	40%	4

Question 4. Which are these factors? More than one answer is possible (only for those whose previous answer was “Other factors”)

Options	Percentage of responses	Number of responses
Electoral commitment of the ruling party	25%	1
Proposal from influential stakeholders	75%	3
Special cultural/economic projects (e.g. Olympic projects)	25%	1
Obsolescence of current plan	75%	3
Required action from a different sector of the public administration	75%	3

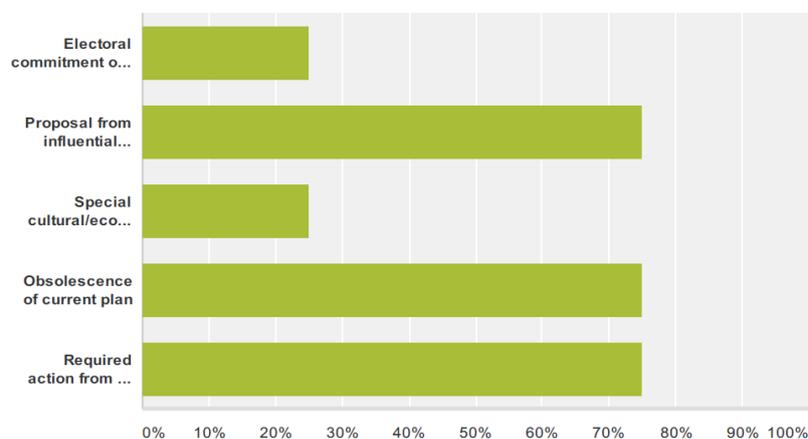


Figure 3. Factors driving changes/revisions of urban plans

Question 5. Has your city established a specific list of objectives related to sustainable urban development?

Options	Percentage of responses	Number of responses
Yes	100%	10
No	0%	0

Question 6. Which documents do formally establish the main urban development objectives of your city? More than one answer is possible (only for those whose previous answer was “Yes”)

Options	Percentage of responses	Number of responses
General Urban Plan	60%	6
Strategy on Infrastructure (road, transport, energy, water, sanitation)	50%	5
Air Quality Plan	30%	3
Energy and Climate Change Strategy	40%	4
Urban Mobility Plan	40%	4
Local Agenda 21	20%	2
Economic Development Strategy (trade, industrial parks, clusters, tourism...)	30%	3
Electoral program of the ruling party (or ruling parties when in coalition or pact)	10%	1

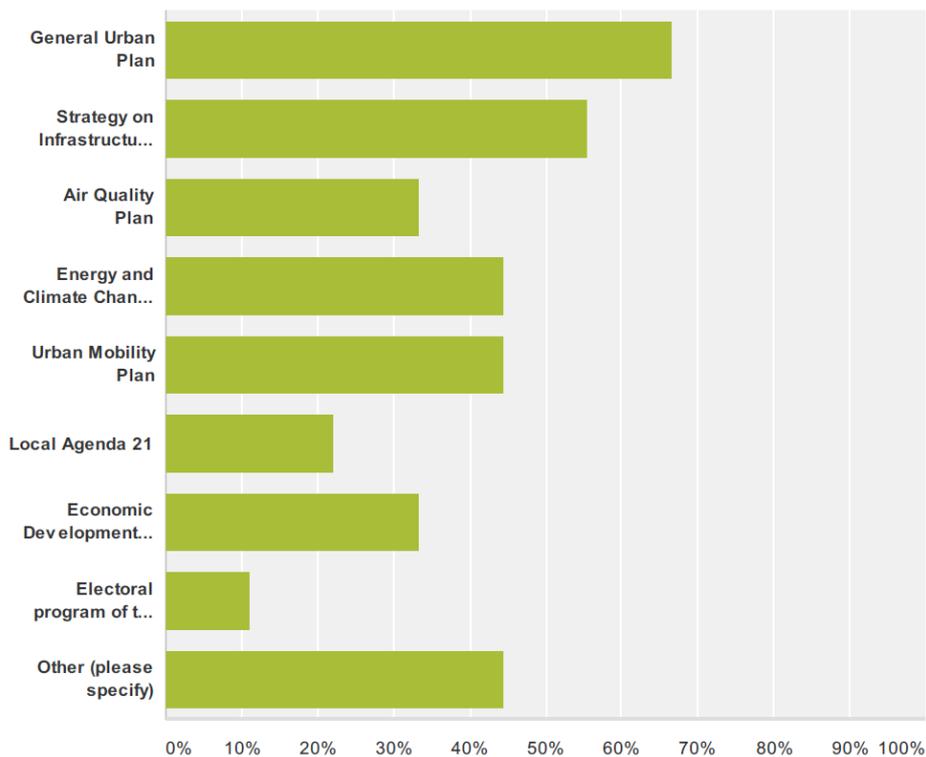


Figure 4. Documents establishing cities’ urban development objectives

Question 7. Which are the main objectives of your city? Maximum 7 responses

Options	Percentage of responses	Number of responses
Competitiveness in the global economy	50%	5
Local economy, focusing on promoting resilient sustainable economies / economic diversity	60%	6
Industry development and job creation	10%	1
Innovation, new technologies development, and job creation	50%	5
Services development and job creation	40%	4
Trade development and job creation	10%	1
Tourism development and job creation	20%	2
Economic efficiency in the provision of public services	20%	2
Liveable streets and neighbourhoods	50%	5
Cultural heritage preservation/improvement	40%	4
Human capital development	10%	1
Cultural offer enhancement	0%	0
Equity and social inclusion, including reduction of spatial segregation	30%	3
Safety	20%	2
Security	30%	3
Stop demographic decline	0%	0
Reduce energy consumption (specially from non-renewable sources)	50%	5
Reduce contribution to climate change	40%	4
Reduce air pollution	40%	4
Reduce noise pollution	0%	0
Reduce water pollution	0%	0
Reduce urban sprawl and land take for transport and settlement purposes	40%	4
Increase citizens' participation	20%	2
Integrated platforms for public services provision	0%	0
Transparency, including open data	20%	2

Other objectives added by participants:

- Quality of Life
- Social inclusion.
- Climate change.
- Economic development.
- Innovation/education.
- Smart city.

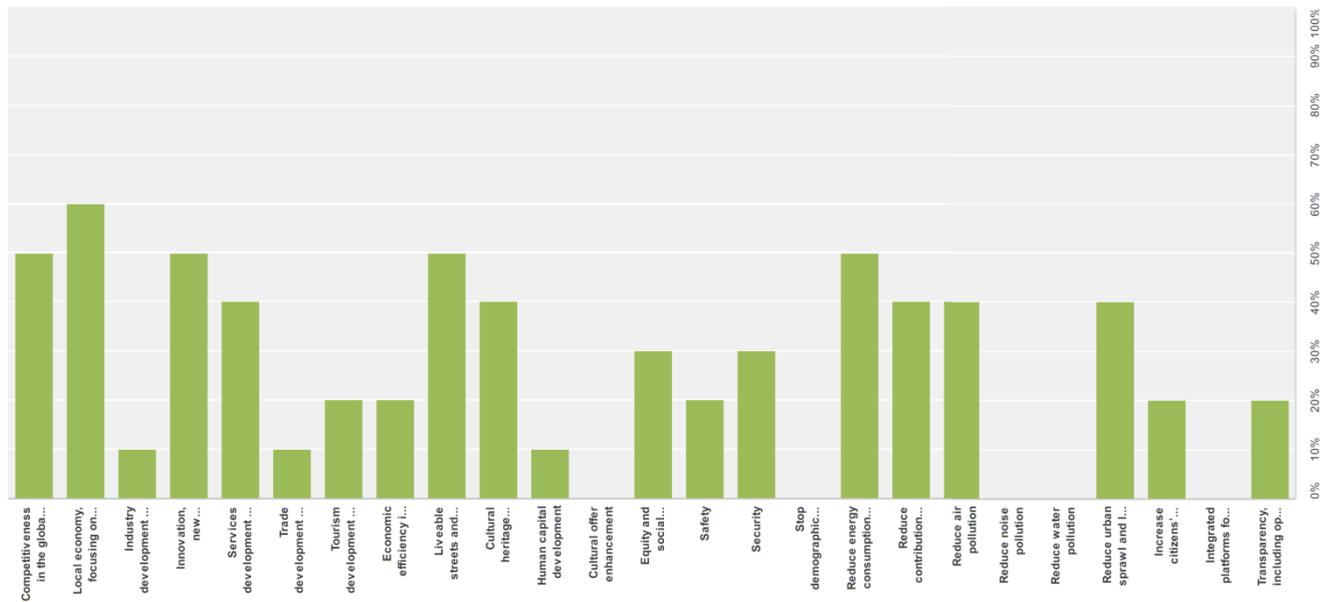


Figure 5. Cities’ main urban development objectives

Conclusions about sustainable urban development objectives

All the cities answering the survey have been recently involved in revising and/or improving urban plans. In most cases (60%), the reason for this has been the need to comply with legal requirements. The remaining 40% obey to other specific objectives, of which the most common are to renew an obsolete urban plan; to attend a required action coming from a different sector of the public administration, and to follow advises or attend the needs of influential stakeholders.

All cities participating in the survey have published a specific list of urban development objectives. The most widespread objective, common to 60% of the cities, is to improve local economy, focusing on promoting resilient sustainable economies and economic diversity. 50% of the cities agree on the following objectives: increase competitiveness in the global economy; increase/improve the liveability of streets and neighbourhoods; reduce energy consumption (especially from non-renewable sources); and promote innovation, new technologies development and job creation.

Other objectives common to 40% of the cities are: reduce urban sprawl and land take for transport and settlement purposes; services development and job creation; cultural heritage preservation/improvement; and reduce air pollution and contribution to climate change.

Those objectives related to the concept of smart cities and good governance, such as increasing the citizens’ participation and fostering the human capital development, seem to receive less attention.

3.1.3 Indicators

Question 8. Does your city have a specific list of outcome indicators for urban development?

Options	Percentage of responses	Number of responses
No, there is not any list of outcome indicators	30%	3
There is a list of outcome indicators but the relation with the corresponding objectives is not clear	40%	4
There is a specific list of outcome indicators clearly related with the objectives	30%	3

Question 9. Does your city have a specific list of intermediate indicators for Urban Development?

Options	Percentage of responses	Number of responses
No, there is not any list of intermediate indicators	50%	5
There is a list of intermediate indicators but the relation with the corresponding outcome indicators is not clear	40%	4
There is a specific list of intermediate indicators clearly related with the outcome indicators	10%	1

Additional information: information about where to find such list of indicators was given by two cities. In one case, it is found in an appendix to the plan, while in the other case indicators are defined in the Strategic Environmental Assessment.

Question 10. Do you use (even if in an informal way) any kind of comparative international indicator system about sustainable urban development (e.g., the Global City Indicators Facility)?

Options	Percentage of responses	Number of responses
No	87.50%	8
Yes	12.50%	1

Question 11. For the following list of indicators please assess their relevance to measure Economic Sustainability objectives, from “not relevant” to “very relevant”?

Indicators	Percentage & Number of answers				Average Score
	Not relevant = 1 point	2 points	3 points	Very relevant = 4 points	
Number of Businesses per 1000 Population	0.00% 0	25.00% 2	50.00% 4	25.00% 2	3.00
Household budget and GDP per capita	0.00% 0	12.50% 1	25.00% 2	62.50% 5	3.50
% unemployment rate	0.00% 0	12.50% 1	12.50% 1	75.00% 6	3.63
Job creation	0.00% 0	0.00% 0	37.50% 3	62.50% 5	3.63
Industrial production index	0.00% 0	25.00% 2	75.00% 6	0.00% 0	2.75
Consumer Price Index (CPI)	0.00% 0	62.50% 5	25.00% 2	12.50% 1	2.50
Foreign direct investment (FDI)	0.00% 0	37.50% 3	50.00% 4	12.50% 1	2.75
Export of goods and services (% of GDP)	0.00% 0	50.00% 4	50.00% 4	0.00% 0	2.50
Visitor expenditures (% of GDP)	0.00% 0	0.00% 0	100.00% 8	0.00% 0	3.00
Land prices	0.00% 0	25.00% 2	62.50% 5	12.50% 1	2.88
Nº of unoccupied flats or buildings	0.00% 0	12.50% 1	75.00% 6	12.50% 1	3.00
Level of congestion	0.00% 0	37.50% 3	50.00% 4	12.50% 1	2.75
Average time spent travelling	0.00% 0	62.50% 5	37.50% 3	0.00% 0	2.38

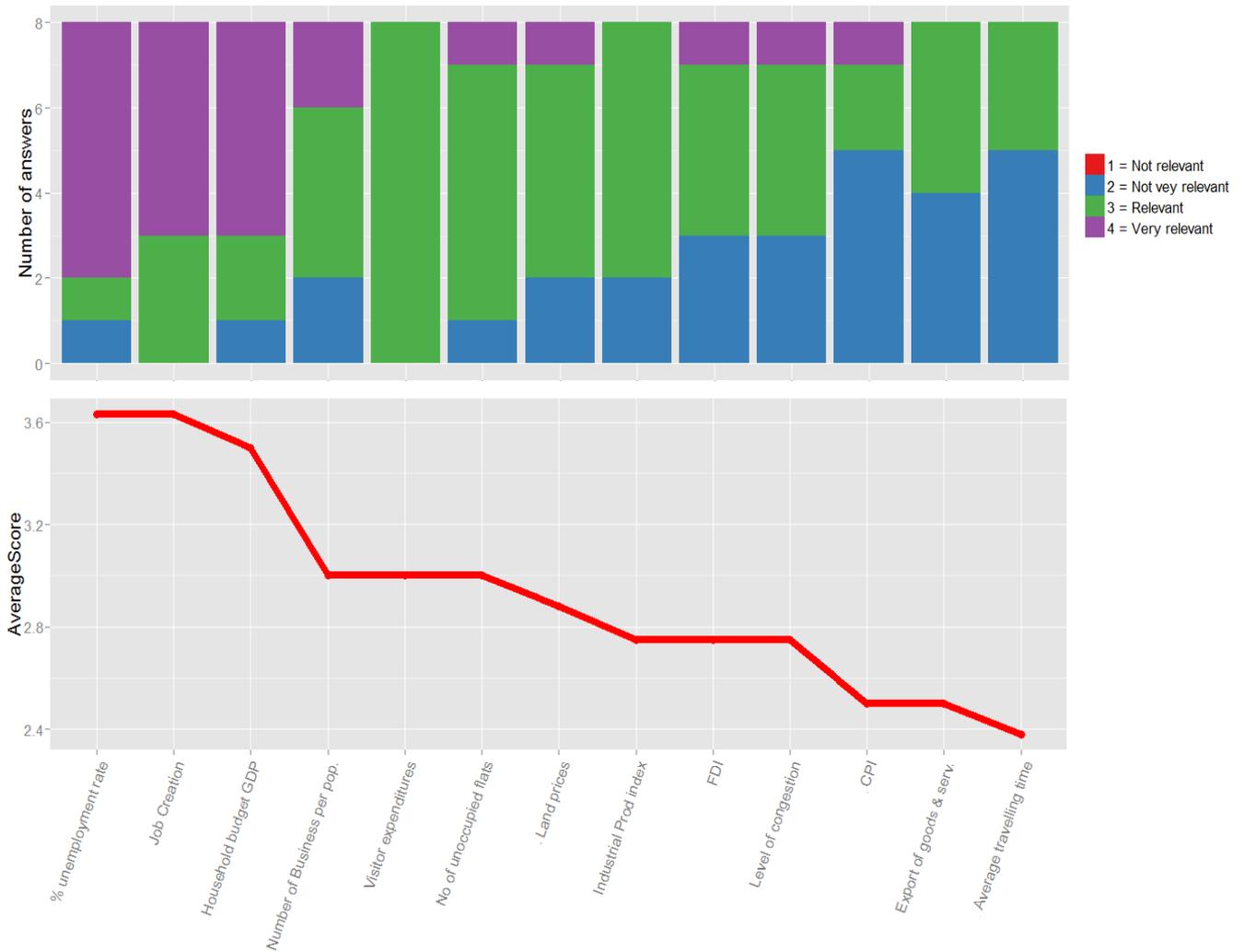


Figure 6. a) Score distribution for each economic indicator; b) Average relevance score

Question 12. For the following list of indicators please assess their relevance to measure Social Sustainability objectives, from “not relevant” to “very relevant”

Indicators	Percentage & Number of answers				Average Score
	Not relevant = 1 point	2 points	3 points	Very relevant = 4 points	
Nº of vulnerable users injured by traffic accidents	0.00% 0	50% 4	37.50% 3	12.50% 1	2.63
Nº of traffic accidents	0.00% 0	37.50% 3	50% 4	12.50% 1	2.75
Traffic accidents with casualties	0.00% 0	50% 4	37.50% 3	12.50% 1	2.63
Fatalities occurred in traffic accidents	0.00% 0	62.50% 5	12.50% 1	25% 2	2.63
Space for pedestrian use	0.00% 0	0.00% 0	37.50% 3	62.50% 5	3.63
Percentage of streets with the minimum safety and quality standards	0.00% 0	12.50% 1	62.50% 5	25% 2	3.13
Traffic light cycle length	25% 2	25% 2	37.50% 3	12.50% 1	2.38
Length of bicycle lanes	0.00% 0	0.00% 0	25% 2	62.50% 5	3.50
Road land occupation	0.00% 0	37.50% 3	25% 2	37.50% 3	3.00
Accessibility of green areas	0.00% 0	0.00% 0	25% 2	75% 6	3.75
Supply of public transport services	0.00% 0	0.00% 0	25% 2	75% 6	3.75
Share of the budget devoted to fundamental needs: housing, nutrition, health, education and transport	0.00% 0	25% 2	37.50% 3	37.50% 3	3.13
Essential services supply in each zone (hospitals, educational centres and stores)	0.00% 0	0.00% 0	50% 4	50% 4	3.50
Number of crime offenses	12.50% 1	37.50% 3	37.50% 3	12.50% 1	2.50
Share of active population	0.00% 0	12.50% 1	25% 4	37.50% 3	3.25

Indicators	Percentage & Number of answers				Average Score
	Not relevant = 1 point	2 points	3 points	Very relevant = 4 points	
Share of population over 60 years	0.00% 0	25% 2	62.50% 5	12.50% 1	2.88
Share of population under 25	0.00% 0	12.50% 1	87.50% 7	0.00% 0	2.88
Share of skilled workers	0.00% 0	12.50% 1	62.50% 5	25% 2	3.13
Migration tendencies	0.00% 0	12.50% 1	62.50% 5	25% 2	3.13
High school and university completion rates	0.00% 0	12.50% 1	12.50% 1	85.71% 6	3.63
Diversity of education degrees offer	0.00% 0	12.50% 1	62.50% 5	25% 2	3.13
Cultural offer and cultural demand (museums, cinema, libraries, theatre, concerts...)	0.00% 0	0.00% 0	26.57% 2	71.43% 5	3.71

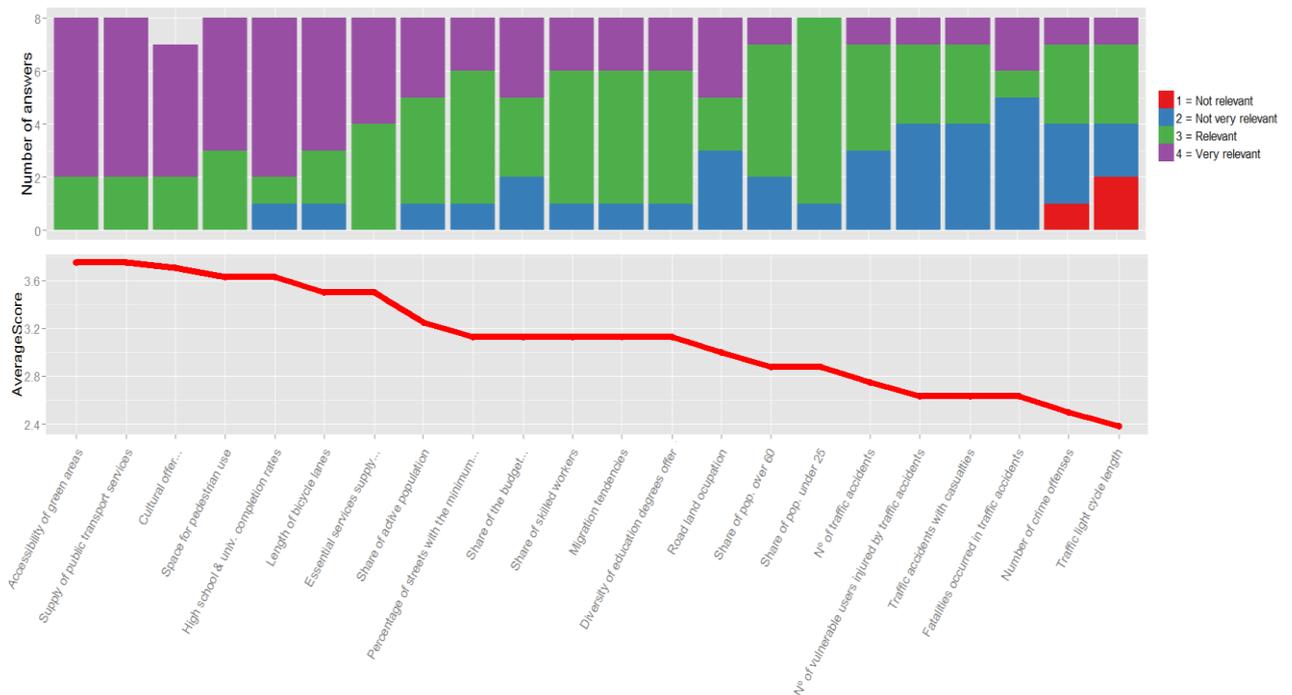


Figure 7. a) Score distribution for each social indicator; b) Average relevance score

Question 13. For the following list of indicators please assess their relevance to measure Environmental Sustainability objectives from “not relevant” to “very relevant”

Indicator	Percentage & Number of answers				Average Score
	Not relevant = 1 point	2 points	3 points	Very relevant = 4 points	
Energy consumption	0.00% 0	0.00% 0	25.00% 2	75.00% 6	3.75
Share of energy consumption by sector (transport, industry, residential, services...)	0.00% 0	0.00% 0	37.50% 3	62.50% 5	3.63
Share of energy consumption coming from renewable sources	0.00% 0	0.00% 0	25.00% 2	75.00% 6	3.75
Greenhouse Gases Emissions	0.00% 0	25.00% 2	37.50% 3	37.50% 3	3.13
Share of Greenhouse Gases Emissions by sector (transport. industry. waste...)	0.00% 0	12.50% 1	62.50% 5	25.00% 2	3.13
Rate of diseases potentially related to air pollution	0.00% 0	25.00% 2	50.00% 4	25.00% 2	3.00
Air concentration of NOx and particles	0.00% 0	12.50% 1	37.50% 3	50.00% 4	3.38
Emissions of NOx and particles generated by transport modes	0.00% 0	12.50% 1	50.00% 4	37.50% 3	3.25
Noise intensity levels	0.00% 0	50.00% 4	25.00% 2	25.00% 2	2.75
Citizens' perception of noise intensity levels	0.00% 0	25.00% 2	62.50% 5	12.50% 1	2.88
Proportion of population exposed to noise	0.00% 0	0.00% 0	75.00% 6	25.00% 2	3.25
Share of the city's wastewater receiving primary, secondary or tertiary treatment	0.00% 0	0.00% 0	50.00% 4	50.00% 4	3.50
Urban density	0.00% 0	0.00% 0	62.50% 5	37.50% 3	3.38
Land occupied by transport infrastructures	0.00% 0	25.00% 2	25.00% 2	50.00% 4	3.25
Share of the metropolitan area population living in the main city	0.00% 0	25.00% 2	50.00% 4	25.00% 2	3.00

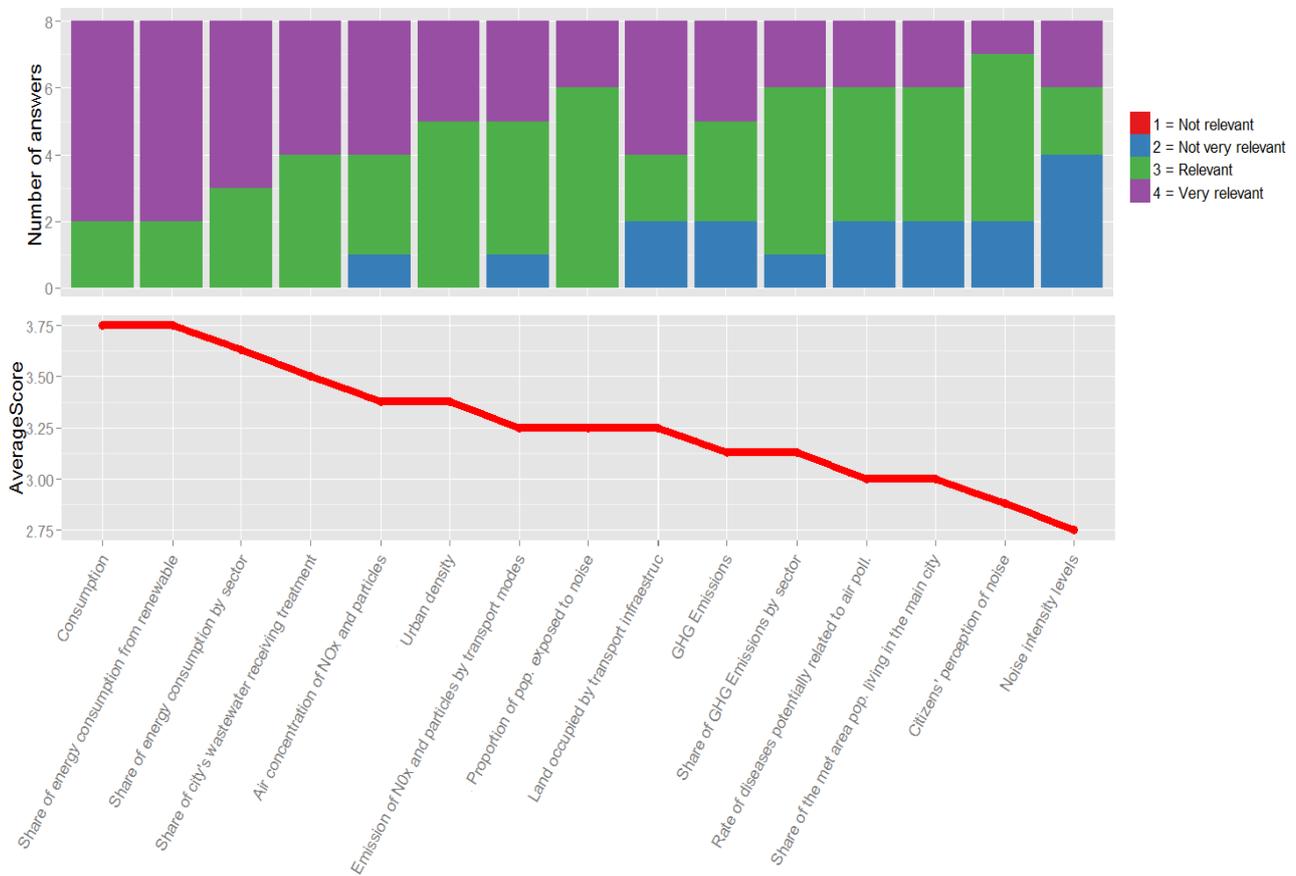


Figure 8. a) Score distribution for each environmental indicator; b) Average relevance score

Conclusions about indicators

There is a lack of a standardised measuring strategy for urban development diagnosis clearly relating objectives, measures and indicators. More than 70% of the cities have a list of outcome indicators², but only for 30% of the cities indicators are clearly related with the city objectives. As for intermediate indicators, only 50% of the cities have a specific list and only for 10% of the cities are intermediate indicators clearly related to outcome indicators. Only one of the surveyed cities uses any kind of comparative international indicator system. Also, there is not an agreement on which are the most relevant indicators. These results suggest the need for a standardised definition of indicators to assess the effectiveness of policies and enable sound comparisons across cities.

² Outcome indicators measure progress towards an objective. Intermediate indicators provide information about the city, but are not an objective per se; in some cases, intermediate indicators can be used to calculate (or obtain a proxy of) outcome indicators.

3.1.4 Policies and measures

Question 14. Which of the following policies/measures related to urban development are implemented in your city? Please indicate the degree of implementation

Policies	Percentage & Number of answers				Average Score
	Not implemented =1 point	Implementation planned = 2 points	Partially implemented/ Implementation progress =3 points	High degree of implementation = 4 points	
Energy demand management policies	0.00% 0	37.50% 3	62.50% 5	0.00% 0	2.63
Energy efficiency policies	0.00% 0	12.50% 1	75.00% 6	12.50% 1	3.00
Promote renewables energies	0.00% 0	12.50% 1	37.50% 3	50.00% 4	3.38
Transport demand management policies	12.50% 1	0.00% 0	50.00% 4	37.50% 3	3.13
Water resources and water waste management policies	12.50% 1	12.50% 1	25.00% 2	50.00% 4	3.13
Material resources and waste management policies	12.50% 1	25.00% 2	37.50% 3	25.00% 2	2.75
Education and awareness rising campaigns	0.00% 0	25.00% 2	37.50% 3	37.50% 3	3.13
Pedestrianisation of historical centres (e.g., retail and cultural areas)	12.50% 1	0.00% 0	62.50% 5	25.00% 2	3.00
Promote social innovation, creative clusters, technology, access to education in neighbourhoods/communities	12.50% 1	25.00% 2	50.00% 4	12.50% 1	2.63
Promote the integration of business parks in the main city areas	25.00% 2	50.00% 4	12.50% 1	12.50% 1	2.13
Improvement, strengthening and competitiveness of industrial areas	25.00% 2	37.50% 3	25.00% 2	12.50% 1	2.25
Financing buildings rehabilitation	25.00% 2	25.00% 2	37.50% 3	12.50% 1	2.38
Financing households refurbishment (including appliances renovation)	28.57% 2	28.57% 2	28.57% 2	14.29% 1	2.29
Empowerment, participation processes	0.00% 0	28.57% 2	42.86% 3	28.57% 2	3

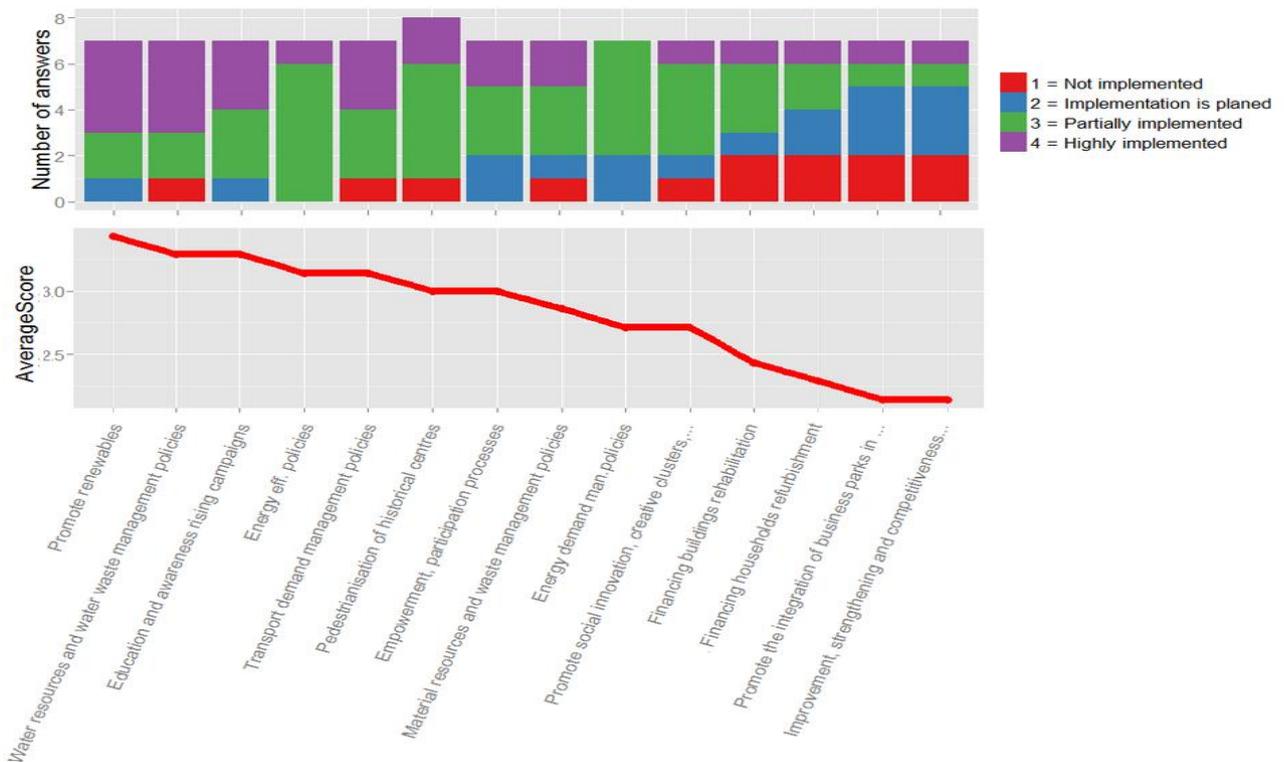


Figure 9. a) Distribution of implementation for each measure; b) Average degree of implementation. Measures in the plots appear in a decedent order from more implemented to less implemented

Conclusions about policies and measures

Although the sustainable urban development objectives are balanced between economic, environmental and social objectives, the most widespread measures are those related to environmental problems. Even when the cities share many objectives, the problems faced by each city and the measures to solve them may vary from city to city or from region to region, which may explain the high diversity of implemented policy measures depending on the city and /or geographical area. Unfortunately the limited number of responses makes it difficult to group cities according to objectives and measures in order to see if there is a relation between policies and city size, geographical area and/or any other characteristics.

3.1.5 Governance and processes

Question 15. At local level: which kind of integration/coordination exists between the departments involved in urban development policies? More than one answer is possible

Frequency	Informal	Horizontal	Case by case	Coordination through hierarchical structures ("Councillors Board")	Formal coordination through some management tools (indicator systems)	Formal coordination through some steering group
Occasional	0	3	1	3	2	4
Frequent	2	3	2	3	0	2
Fluent daily interaction	5	2	5	1	1	1

Question 16. Concerning coordination with different administrations (local, regional, National, European): is there any kind of collaborative process or structure in place with the following institutions? More than one answer is possible

Options	Percentage	Number of answers
Neighbour City Councils	87.50%	7
Regional Government	75.00%	6
National Government	87.50%	7
European Commission	37.50%	3
None	0.00%	0

Question 17. Is there any collaborative process in place with stakeholders (i.e., citizen associations, environmental associations, transport companies. etc.), such as stakeholder consultations, round tables, task forces, etc.?

Options	Percentage	Number of answers
No	25%	2
Yes. Please specify which kind of collaborative process and which stakeholders are involved	75%	6

The groups of stakeholders and the kind of collaborative process is project dependent. The stakeholder groups that participate in such processes include: representatives from local neighbourhoods, representatives from local environmental organisations, representatives from transport and building societies, young people's council, and research institutions. Interaction occurs via round tables, task forces, etc.

Question 18. How often do stakeholders directly participate in policy making regarding urban development?

Options	Percentage & Number of answers					Average participation
	Never	Rarely	Occasionally	Frequently	Very Frequently	
Chamber of commerce	12.50% 1	12.50% 1	25.00% 2	50.00% 4	0.00% 0	3.13
Trade unions	12.50% 1	37.50% 3	0.00% 0	50.00% 4	0.00% 0	2.88
Employers organisations	12.50% 1	25.00% 2	25.00% 2	37.50% 3	0.00% 0	2.88
Private companies	0.00% 0	12.50% 1	37.50% 3	25.00% 2	25.00% 2	3.63
Citizens associations	0.00% 0	12.50% 1	0.00% 0	50.00% 4	37.50% 3	4.13
Environmental associations	0.00% 0	0.00% 0	12.50% 1	37.50% 3	50.00% 4	4.38

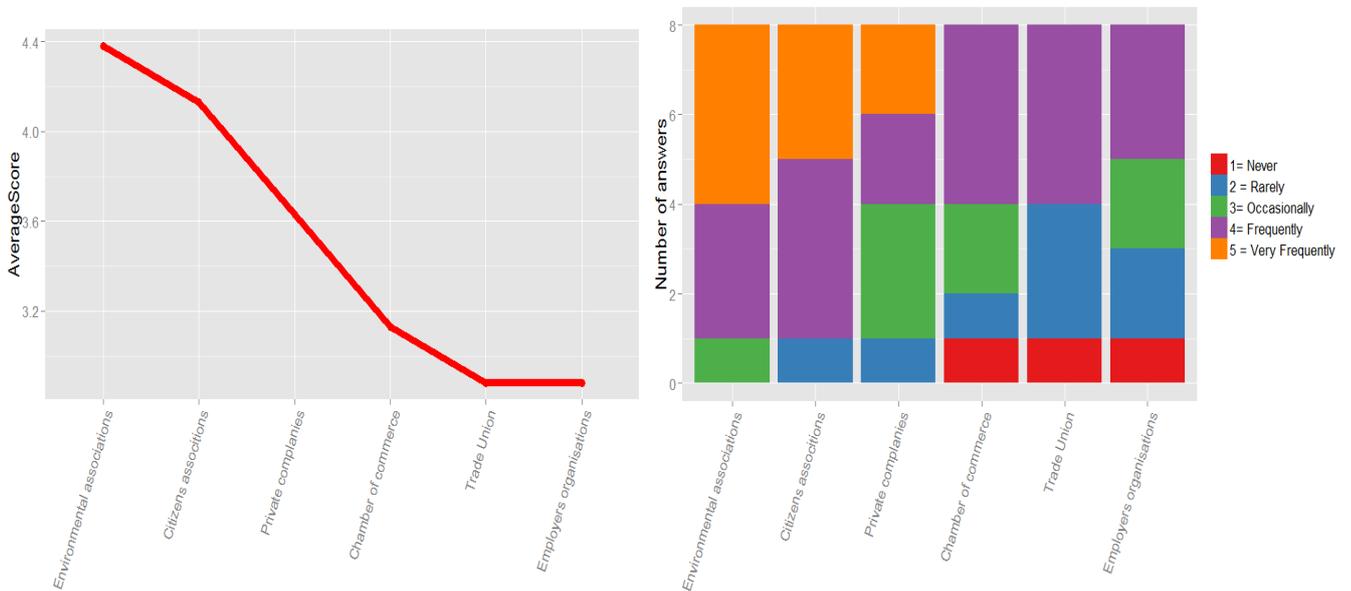


Figure 10. a) Average degree of stakeholders participation; b) Level of participation per stakeholder group

Question 19. To what degree do you find each of the following stages of the policy cycle problematic in the delivery of urban development strategies?

Options	Not at all problematic	Not very problematic	Fairly problematic	Very problematic	Average
Problem formulation and issue identification	12.50% 1	25.00% 2	62.50% 5	0.00% 0	2.50
Stakeholder consultations	12.50% 1	62.50% 5	25.00% 2	0.00% 0	2.13
Analysis and evaluation of threats and opportunities	12.50% 1	62.50% 5	12.50% 1	12.50% 1	2.25
Issue specification and agenda setting (selection of issues to be tackled)	0.00% 0	37.50% 3	50.00% 4	12.50% 1	2.75
Policy formulation (analysis of policy alternatives and selection of policies)	12.50% 1	12.50% 1	50.00% 4	25.00% 2	2.88
Policy instrument design and development	0.00% 0	25.00% 2	62.50% 5	12.50% 1	2.88
Coordination	0.00% 0	50.00% 4	50.00% 4	0.00% 0	2.50
Discussion / Debate	0.00% 0	62.50% 5	37.50% 3	0.00% 0	2.38
Decision / Approval	12.50% 1	25.00% 2	62.50% 5	0.00% 0	2.50
Implementation	0.00% 0	37.50% 3	50.00% 4	12.50% 1	2.75
Evaluation / Assessment	0.00% 0	37.50% 3	50.00% 4	12.50% 1	2.75

Conclusions on governance and processes

Urban development policies involve many different areas — transport, health, education, etc. — and affect different groups of stakeholders, requiring complex coordination processes. Such coordination occurs at different levels, from informal daily interaction to occasional formal coordination through some steering group, case by case interactions being the most common. Mechanisms for coordination with other regional, national and international public administrations are also in place.

More than 75% of the surveyed cities are involved in some kind of participative process with stakeholders. Citizens associations, environmental associations and private companies are the stakeholders most commonly involved in such processes.

Policy formulation (analysis of policy alternatives and selection of policies) and policy instrument design and development seem to be the most problematic stages of the policy cycle, while stakeholder consultation is identified as the less problematic stage.

3.1.6 Urban policy models and other decisions support tools

Question 20. How often are urban models used in your city to evaluate the potential impact of future policies?

Frequency	Percentage	Number of answers
Very Frequently	12,50%	1
Frequently	0,00%	0
Occasionally	25,00%	2
Rarely	37,50%	3
Never	25,00%	2

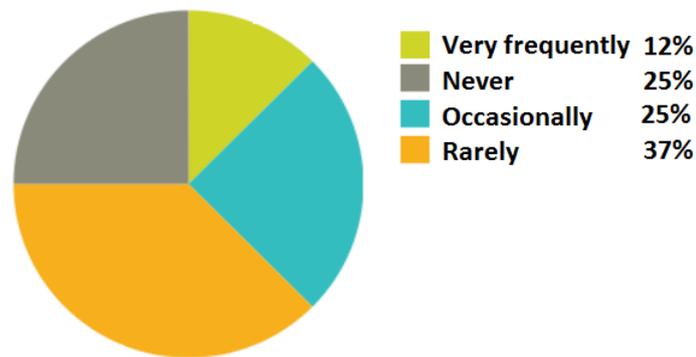


Figure 11. Frequency of use of urban models for policy assessment

Question 21. Please, indicate in which parts of the policy cycle (if any) are urban simulation models and other ICT tools used in your city, they are partially used or you think they should be used

Policy cycle stages	Percentage & Number of answers			
	Used in your city	Implemented at a very basic level	Are not used but it would be beneficial	Are not used because they are not relevant
Problem formation and issue identification	25,00% 2	25,00% 2	50,00% 4	0,00% 0
Stakeholder consultations	00,00% 0	37,50% 3	37,50% 3	25,00% 2
Analysis and evaluation of threats and opportunities	37,50% 3	25,00% 2	37,50% 3	0,00% 0
Issue specification and agenda setting	12,50% 1	25,00% 2	62,50% 5	0,00% 0
Policy formulation (analysis of policy alternatives and selection of policies)	25,00% 2	25,00% 2	50,00% 4	00,00% 0

Policy cycle stages	Percentage & Number of answers			
	Used in your city	Implemented at a very basic level	Are not used but it would be beneficial	Are not used because they are not relevant
Policy instrument design and development	37,50% 3	0,00% 0	50,00% 4	12,50% 1
Coordination	12,50% 1	25,00% 2	50,00% 4	12,50% 1
Discussion / Debate	37,50% 3	0,00% 0	37,50% 3	25,00% 2
Decision / Approval	25,00% 2	12,50% 1	37,50% 3	25,00% 2
Implementation	25,00% 2	12,50% 1	62,50% 5	0,00% 0
Evaluation / Assessment	12,50% 1	37,50% 3	50,00% 4	0,00% 0

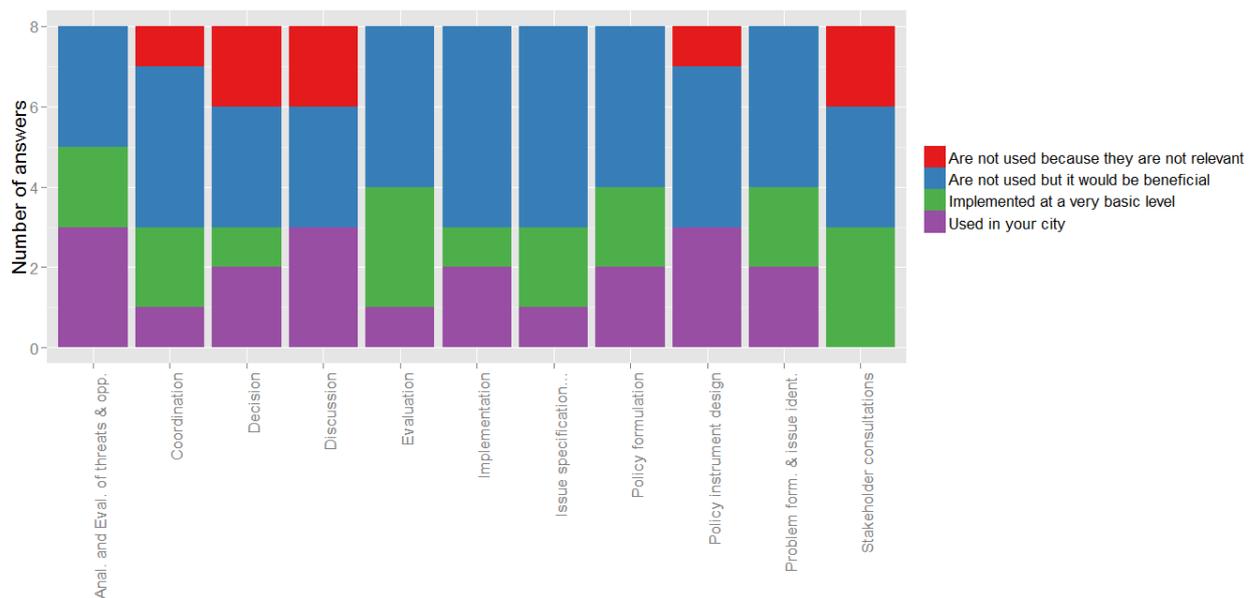


Figure 12. Degree of models use in the different stages of the policy cycle

Question 22. Based on your experience, specify the degree in which the modelling results influence policy decisions?

Options	Percentage	Number of answers
They are usually not taken into account	37,50%	3
They are taken into account but other criteria usually prevail	50,00%	4
They are an essential part of the decision making process	12,50%	1

Question 23. In your opinion, which are the main areas for improvement in relation to urban modelling and simulation? Multiple choice is possible

Options	Percentage	Number of answers
Reliability and credibility of model results	62,50%	5
Availability and accuracy of input data	62,50%	5
Speed of calculation	25,00%	2
Facilitate interpretation of results	50,00%	4
Cost of the model	37,50%	3
Connection between model and real scenarios	87,50%	7
Level of knowledge and skills required to use them	25,00%	2
Continuous dependence on software provider	25,00%	2

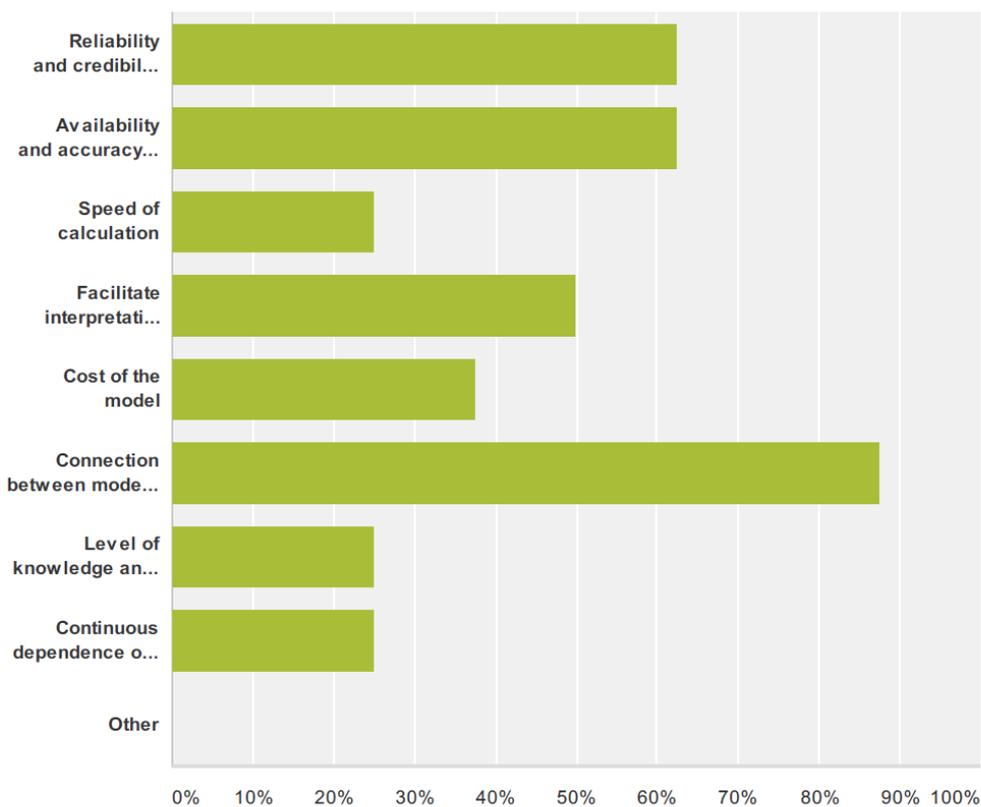


Figure 13. Main areas of improvement for urban models

Conclusions on urban models and decision support tools

Even when urban simulation models are used in more than 60% of the participating cities, the frequency of use varies across cities, and the results obtained is not considered as an essential criterion for the decision making process.

Models and decision support tools are implemented (even if it is at a very basic level) in 50% or more of the cities in the following stages of the policy cycle: problem formation and issue identification; analysis and evaluation of threats and opportunities; policy formulation (analysis of policy alternatives and selection of policies); and evaluation/assessment. 50% of the cities consider that it would be beneficial to implement them for the following stages: problem formation and issue identification; issue specification and agenda setting; policy formulation (analysis of policy alternatives and selection of policies); policy instrument design and development; coordination; implementation; and evaluation/assessment.

With respect to the perception of policy makers about models and their main area of improvement, more than 80% thinks that the realism of the scenarios contemplated by the models should be improved. More than 60% think that the credibility of the results should also improve, and identify the lack of accurate input data as one of the main shortcomings.

3.2 Modellers/technicians questionnaire results

3.2.1 Characterisation of the respondents

Since the staff involved in urban modelling and policy making processes may belong either to research centres, public administrations or private consultancies, we opened the questionnaire to all of them and consider answers of modellers from the same city belonging to different institutions.

At the moment of writing this report, we had received answers from 18 technicians/modellers from 13 cities in 11 different countries. As in the case of the policy makers’ survey, we didn’t get any feedback from countries in Eastern Europe.

Table 3. List of cities participating in the modellers’ survey

Region	Country	City
Northern Europe	Sweden	Stockholm
	Denmark	Copenhagen
	England	Sheffield
Southern Europe	Spain	Madrid
		Barcelona
	Greece	Thessaloniki
	Italy	Rome
Western Europe	Austria	Vienna
	France	Paris
	Germany	Dortmund
	Belgium	Brussels
	Netherlands	Rotterdam
Utrecht		

Question 1: profile of the respondents

In the case of modellers, the profile of respondents is more diverse than in the case of the policy makers questionnaire 38.88% of them are principal urban planners belonging to different urban planning departments, 11.11% are principal transport planners, 16.66% are project managers related to urban and smart city projects, 16.66% are architects working in different areas of urban planning, 11.11% are counsellors and company partners, and 5.56% are European officers. Their affiliation and their field of work within their organisation is detailed in section 3.2.2 below.

3.2.2 Affiliation, competences and responsibilities

Question 2. Which kind of organisation do you work for? More than one answer is possible

Options	Percentage	Number of answers
Public administration	77.78%	14
Private consultancy / engineering / architecture firm	16.67%	3
Academic / research institution	11.11%	2

Question 3. In which way does your organisation participate in Urban Planning processes? (Only for those not working at a public administration)

Options	Percentage	Number of answers
We work in close collaboration with urban planning authorities	25.00%	1
We collaborate in specific projects with urban planning authorities	75.00%	3
We seldom collaborate with urban planning authorities	0.00%	0

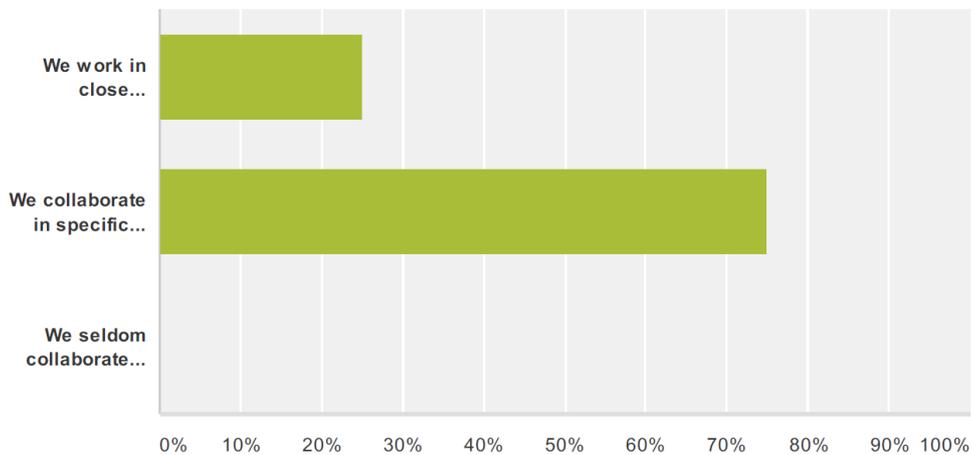


Figure 14. Frequency of collaboration between private companies/research centres with public administrations (according to private companies and research centres)

Question 4. Does your department collaborate with other departments of the administration related with urban development (e.g., health, environment or transport department)? (Only for those working at public administrations)

Options	Percentage	Number of answers
No	0%	0
Yes	100%	14

The different areas and departments collaborating are: Land use, Transport Planning, Environment and infrastructures and, to a lesser extent, Public Health, Energy, Housing and Real State, Finances, Culture and Sustainable Development.

Question 5. Does your organisation/department collaborate in any way with other private and/or academic Urban Planning agents? (Only for those working at a public administration)

Options	Percentage	Number of answers
Yes, we often collaborate in joint projects	64.29%	9
We have some occasional collaborations	21.43%	3
We seldom collaborate with other agents	14.29%	2

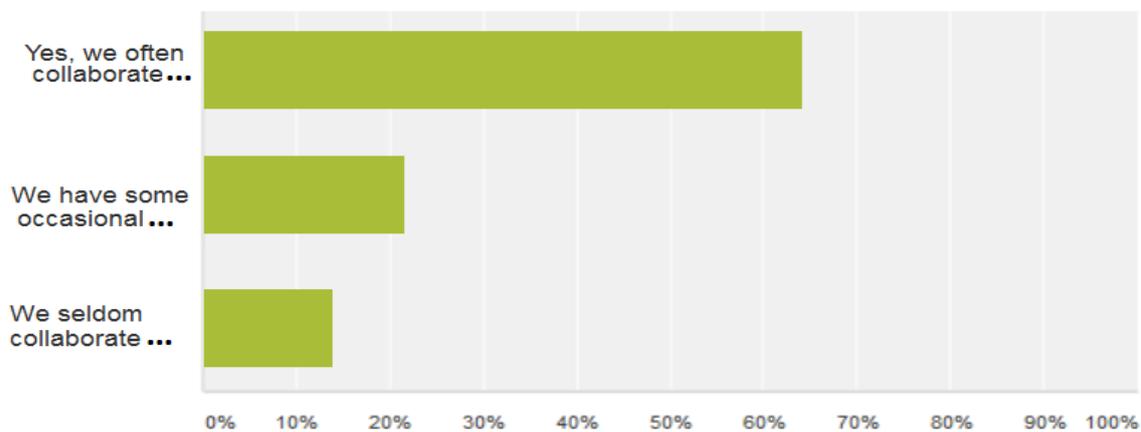


Figure 15. Degree of collaboration between public sector and private companies and research centres (according to public administrations)

Question 6. Which field related to urban planning process is your organisation focused on? More than one answer is possible

Options	Percentage	Number of answers
Mobility and transport planning	83.33%	15
Management of infrastructure and services	50.00%	9
Land use planning at territorial level	94.44%	17
Development of detailed urban land use plans	72.22%	13
Definition of urban regeneration policies at a district or neighbourhood scale	50.00%	9
Economics	27.78%	5

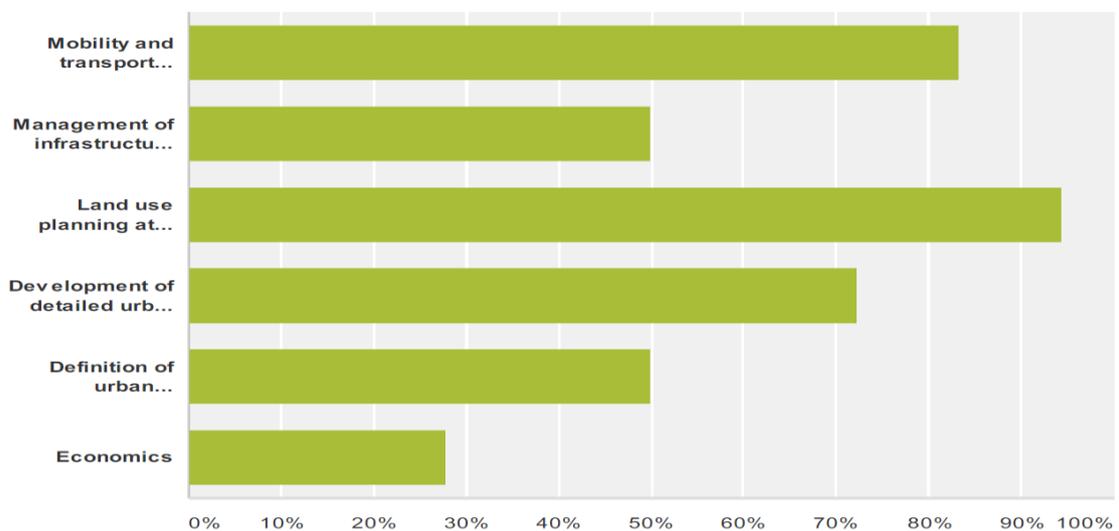


Figure 16. Specific field of work of questionnaire participants

Conclusions on integrated urban planning

There seems to be a close collaboration not only between different departments of the public administration but also between public and private organisations, which in principle should provide the conditions for reducing the communication gaps between model developers working in academia, public administrations and/or private companies and practitioners (model users) working at public administrations.

3.2.3 Governance and processes

Question 7. To what extent do you think that technicians, urban planners and decision makers work in an integrated way?

Options	Percentage	Number of answers
Not at all	5.56%	1
We seldom communicate or work in an integrated way	0.00%	0
We collaborate in specific occasions but collaboration is insufficient	66.67%	12
We work in close collaboration	27.78%	5

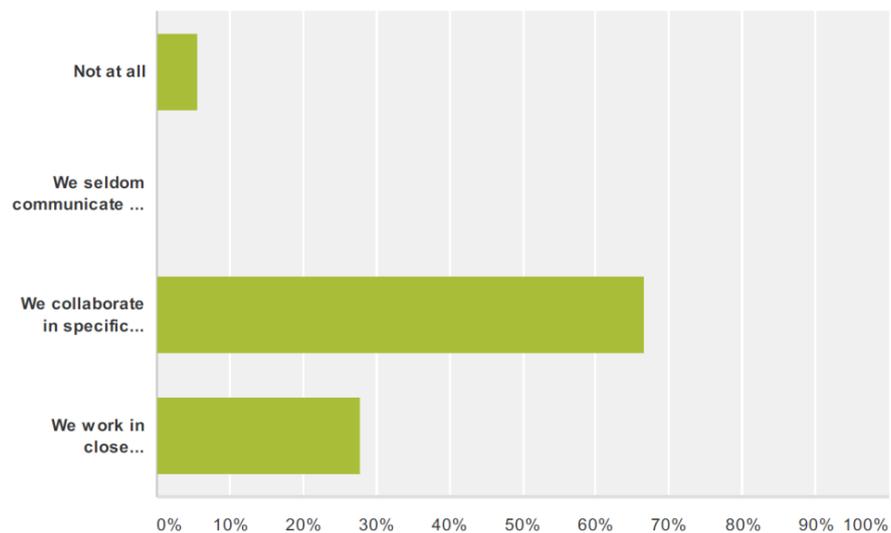


Figure 17. Frequency of collaboration between modellers and policy makers

Conclusions on governance processes

A majority of respondents feel that the collaboration between technicians/modellers and decision makers is insufficient.

3.2.4 Models and tools

Question 8. Which kind of models do you work with? How are they developed?

Options	Percentage & Number of answers					Total number of answers
	In house development	In house development + Consultants	Open source	Commercial tool	I do not know	
Location-Allocation models of urban facilities	43.75% 7	12.50% 2	0.00% 0	6.25% 1	37.50% 6	16
LUTI / Land Use	33.33% 6	33.33% 6	5.56% 1	5.56% 1	22.22% 4	18
Travel demand models	22.22% 4	44.44% 8	0.00% 0	11.11% 2	22.22% 4	18
Economic models	25.00% 3	33.33% 4	0.00% 0	8.33% 1	33.33% 4	12
Visualisation tools	30.77% 4	15.38% 2	15.38% 2	15.38% 2	23.08% 3	13
GIS tools	38.89% 7	33.33% 6	5.56% 1	16.67% 3	5.56% 1	18
ICT tools for public participation	8.33% 1	25.00% 3	16.67% 2	16.67% 2	33.33% 4	12

Some specific examples of Open source and commercial tools used by the respondents are:

- Open source:
 - Visualisation: GIMP, Irfanview, VCL
 - GIS: QGIS
 - Some of the in-house developed tools are planned to be made open source in a near future.
- Commercial tools:
 - GIS: ArcGIS
 - Models based on and programmed in commercial software, such as TransCad, Emme, etc.

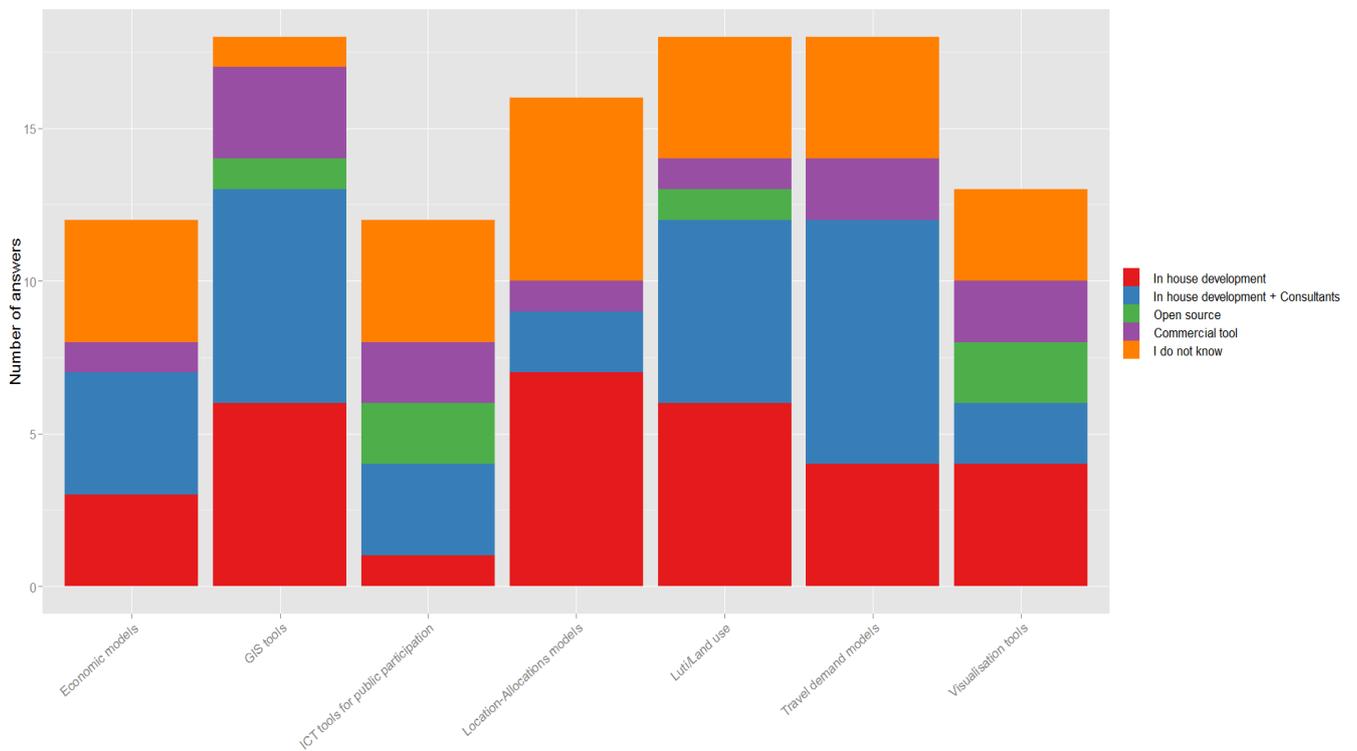


Figure 18. Popularity of use per model type and model development characteristics

Question 9. If you use any other type of model or tool which is not reflected above, please add it below indicating the name and the source (open source, commercial tool)

- Microsimulation (Highway) Models based upon AIMSUN software
- Air Quality Models based upon Airviro software
- Demand Strategic Multi-Modal Models
- Commercial: Microstation, Adobe, Office
- rAps (Regional Analysis and Prognosis System) regional economic model.

Question 10. Which land use attributes are included as input/output parameters in your models/tools?

Options	Percentage	Number of answers
Population development	70.59%	12
Residential building density	94.12%	16
Non-residential/office building density	82.35%	14
Rental vs. Ownership in housing	23.53%	4
Mixed use development	70.59%	12
Mobility infrastructure (roads, public transport, cycling, etc.)	88.24%	15
Public services	82.35%	14
Cultural heritage	58.82%	10
Public space, parks and/or green space	94.12%	16
Future (expected) demand for residential space	58.82%	10
Risks (e.g. flooding, etc.)	47.06%	8
Air quality	52.94%	9
Noise	64.71%	11
Human qualities (e.g. attractiveness, safety, etc.)	23.53%	4
Land or building market value	41.18%	7
Property/cadastral structure	58.82%	10
Policy and planning strategies	70.59%	12
Accessibility to labour forcé	23.53%	4
Accessibility to work place	41.18%	7
Transport accessibility: roads	94.12%	16
Transport accessibility: public transport	88.24%	15
Transport accessibility: cycling infrastructure	70.59%	12

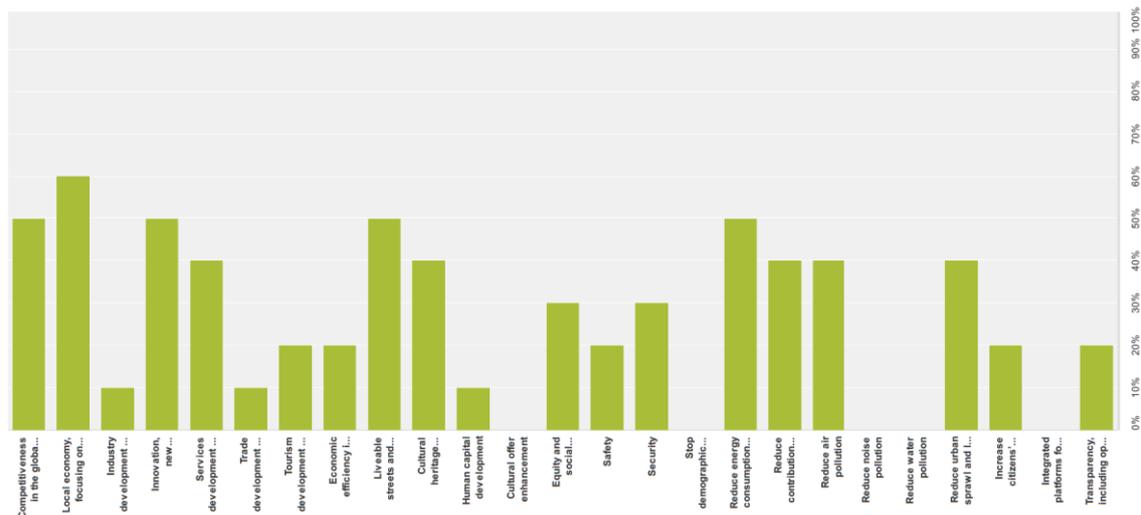


Figure 19. Specific land use attributes used by the models

Question 11. How do you get access to the data processed by the model? More than one answer is possible

Options	Percentage	Number of answers
The data is available free of charge	47.06%	8
The data is purchased from external providers	47.06%	8
The data is available internally	76.47%	13
Using data mining techniques on alternative data sources (mobile phones, smart meters, etc.)	11.76%	2

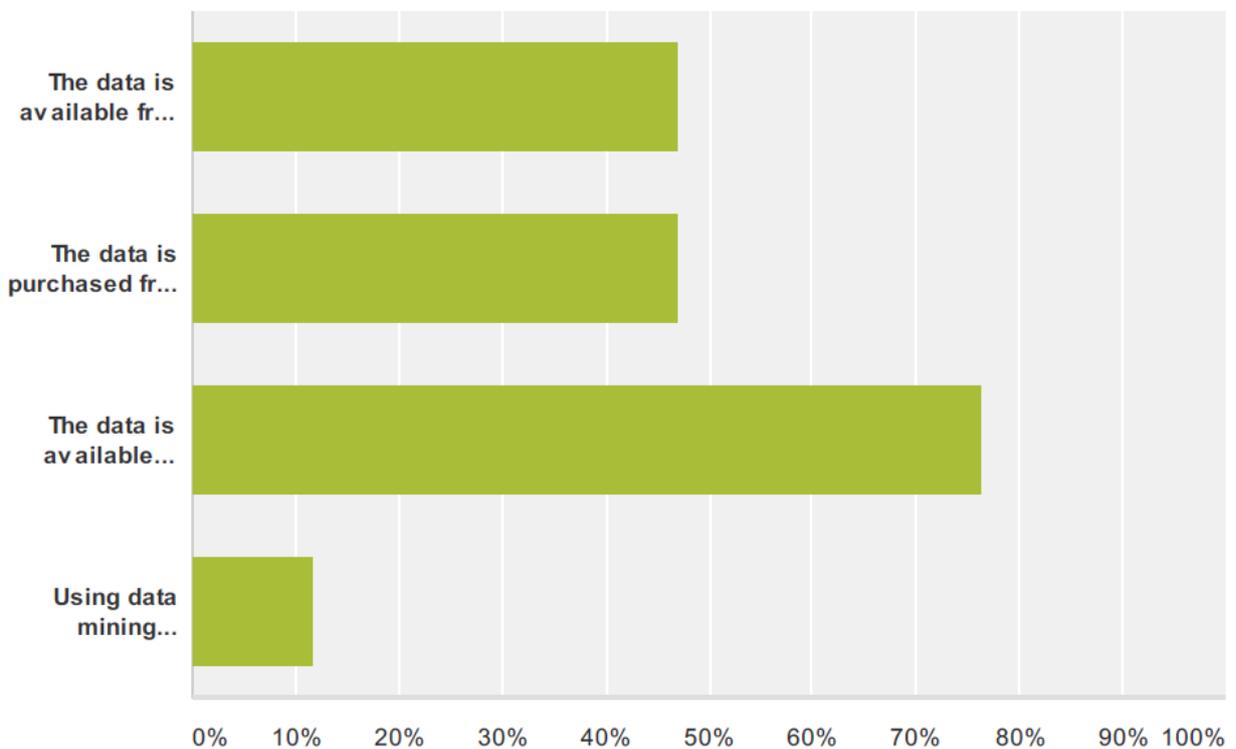


Figure 20. Data accessibility to feed the models

Question 12. In your opinion what are the main problems modellers encounter related to data provision? More than one answer is possible

Options	Percentage	Number of answers
Accessibility to data	75.00%	12
Cleanness of data	50.00%	8
Data is not collected ad-hoc for the models and has to be mined from other sources	18.75%	3
Privacy issues with personal data	31.25%	5

Other:

- Acquire data of sufficient quality at the right scale of analysis
- Political restrictions
- Access to a specific kind of data

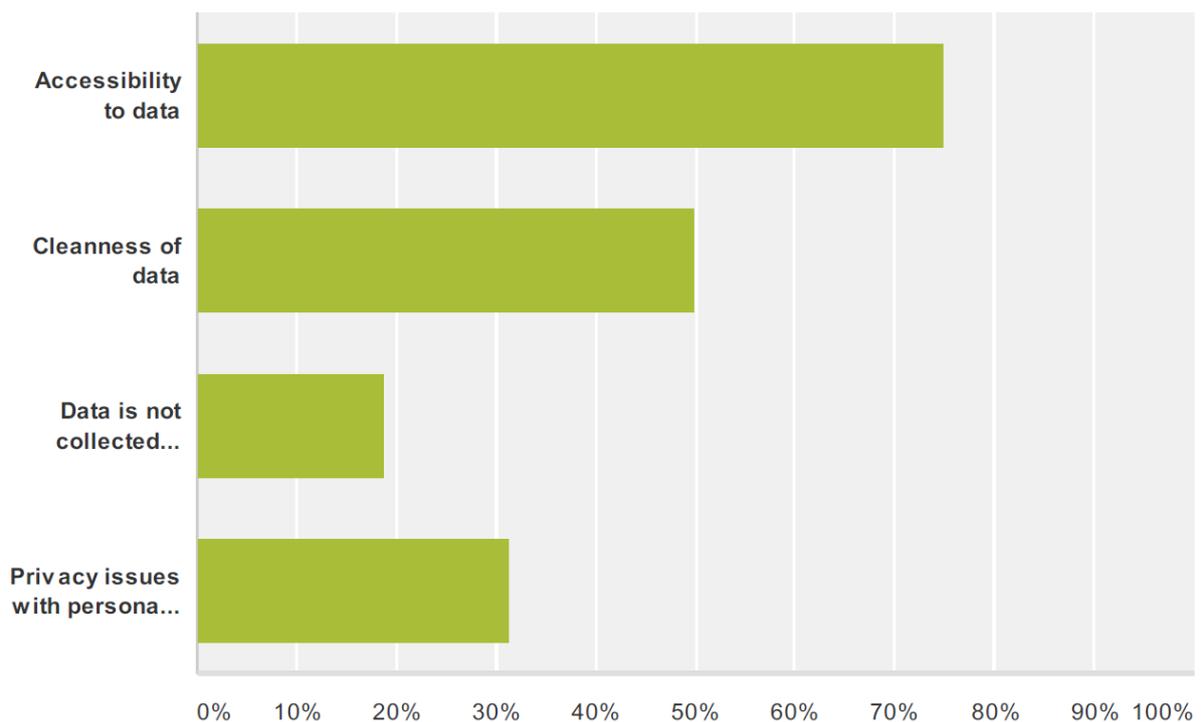


Figure 21. Main problems encountered with data provision

Question 13. Please evaluate the importance of the following technical aspects of models and tools

Options	Percentage & Number of answers				Total average score
	Not important =1 point	Not very important = 2	Important = 3	Very important = 4	
Architecture framework robustness	0.00% 0	31.25% 5	43.75% 7	25.00% 4	2.94
Architectural improvement flexibility	0.00% 0	25.00% 4	62.50% 10	12.50% 2	2.88
Data sources compatibility / Data types supported	0.00% 0	6.25% 1	50.00% 8	43.75% 7	3.38
Databases storage capacity	0.00% 0	25.00% 4	56.25% 9	18.75% 3	2.94
Data analysis efficiency	6.67% 1	13.33% 2	46.67% 7	33.33% 5	3.07
Interoperability	0.00% 0	12.50% 2	56.25% 9	31.25% 5	3.19
Hardware requirements	0.00% 0	25.00% 4	50.00% 8	25.00% 4	3.00
Scalability	0.00% 0	13.33% 2	73.33% 11	13.33% 2	3.00
Multiple interfacing capability	0.00% 0	37.50% 6	43.75% 7	18.75% 3	2.81
Visualisation support	0.00% 0	12.50% 2	50.00% 8	37.50% 6	3.25
Ease of accessibility	0.00% 0	18.75% 3	62.50% 10	18.75% 3	3.00
Robustness of Data Base Management System	0.00% 0	18.75% 3	50.00% 8	31.25% 5	3.13
Multiple output generation	0.00% 0	40.00% 6	60.00% 9	0.00% 0	2.60
SDK (Software Development Kits) support	6.25% 1	31.25% 5	56.25% 9	6.25% 1	2.63
Skills required to use the tool	0.00% 0	12.50% 2	68.75% 11	18.75% 3	3.06
Processing time	0.00% 0	18.75% 3	50.00% 8	31.25% 5	3.13

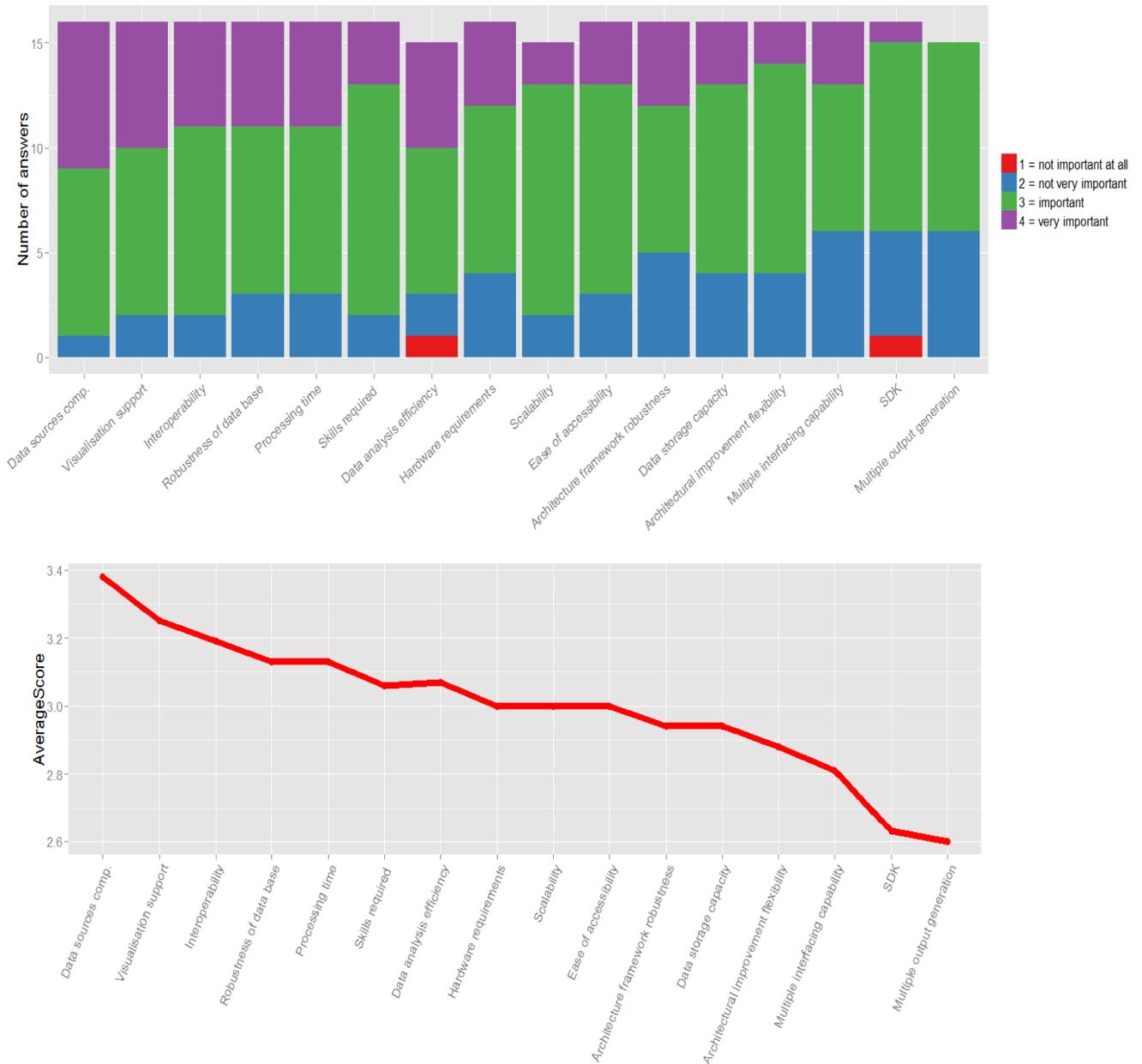


Figure 22. a) Score distribution of relevance of technical aspects; b) Average degree of relevance of each technical aspect

Question 14. Please indicate in which parts of the policy cycle (if any) are urban simulation models and/or other ICT tools used in your city. Multiple choices are possible

Options	Percentage & Number of answers			
	Used in your city	Implemented at very basic level	Are not used but would be beneficial	Are not used since they are not relevant
Problem formulation and issue identification	21,43% 3	21,43% 3	50,00% 7	7,14% 1
Stakeholder consultations	7,14% 1	71,43% 10	21,43% 3	0,00% 0
Analysis and evaluation of threats and opportunities	28,57% 4	21,43% 3	50,00% 7	0,00% 0
Issue specification and agenda setting (selection of issues to be tackled)	7,69% 1	46,15% 6	46,15% 6	0,00% 0
Policy formulation (analysis of policy alternatives and selection of policies)	21,43% 3	35,71% 5	42,86% 6	0,00% 0
Policy instrument design and development	28,57% 4	28,57% 4	28,57% 4	14,29% 2
Coordination	28,57% 4	50,00% 7	14,29% 2	7,14% 1
Discussion / Debate	28,57% 4	35,71% 5	28,57% 4	7,14% 1
Decision / Approval	42,86% 6	14,29% 2	35,71% 5	7,14% 1
Implementation	30,77% 4	23,08% 3	38,46% 5	7,69% 1
Evaluation / Assessment	28,57% 4	42,86% 6	21,43% 3	7,14% 1

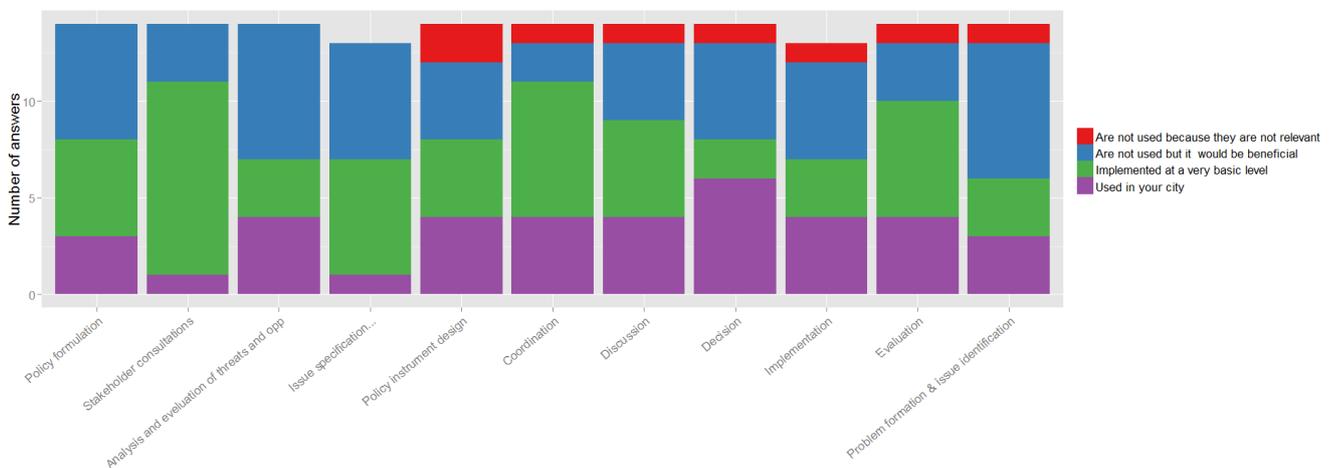


Figure 23. Degree of use of models and decision support tools in the different stages of the policy cycle

Question 15. How often stakeholders directly participate in the design/definition/calibration of the models?

Stakeholders groups	Percentage & Number of answers					Average score
	Never	Rarely	Occasionally	Frequently	Very Frequently	
Citizens associations	46.67% 7	26.67% 4	6.67% 1	13.33% 2	6.67% 1	2.07
Environmental associations	33.33% 5	40.00% 6	0.00% 0	20.00% 3	6.67% 1	2.27
Private companies	20.00% 3	40.00% 6	26.67% 4	13.33% 2	0.00% 0	2.33
Chamber of commerce	40.00% 6	33.33% 5	20.00% 3	6.67% 1	0.00% 0	1.93
Trade unions	53.33% 8	33.33% 5	6.67% 1	6.67% 1	0.00% 0	1.67
Employers organisations	60.00% 9	33.33% 5	6.67% 1	0.00% 0	0.00% 0	1.47

Other:

- Universities

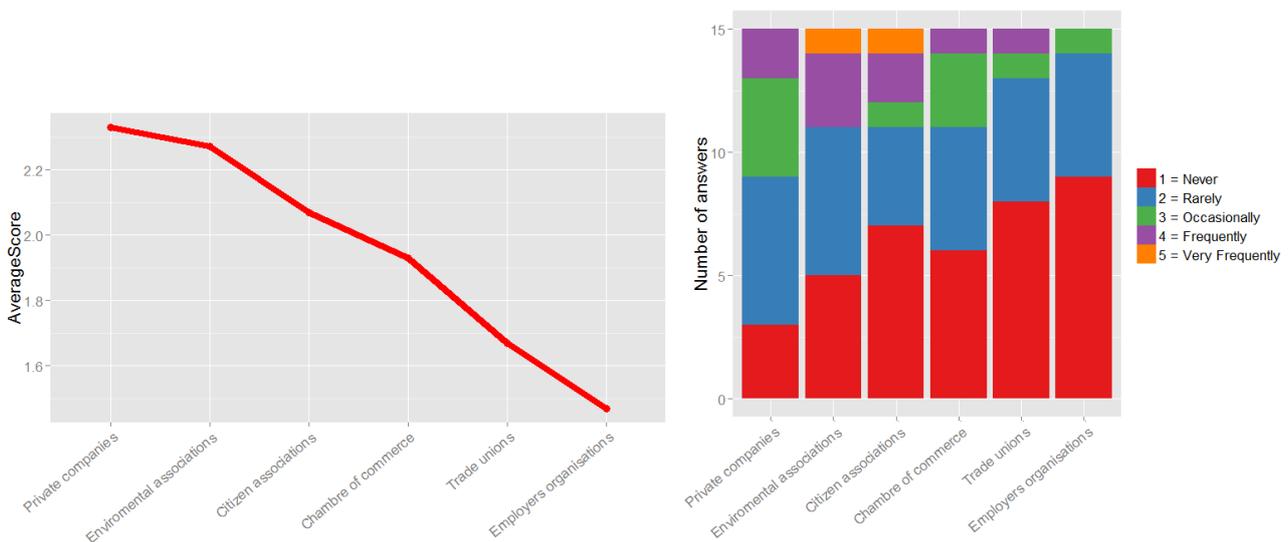


Figure 24. a) Average level of stakeholders participation in design/definition/calibration of the model; b) Frequency distribution of stakeholders participation per group of stakeholders

Question 16. In your opinion, which are the main areas for improvement in relation to urban modelling?

Options	Percentage	Number of answers
Reliability and credibility of model results	62.50%	10
Availability and accuracy of input data	93.75%	15
Speed of calculation	25.00%	4
Facilitate interpretation of results	62.50%	10
Cost of the model	37.50%	6
Connection between model and real scenarios	75.00%	12
Level of knowledge and skills required to use them	56.25%	9
Other	6.25%	1

Other:

- Integration in decision-making

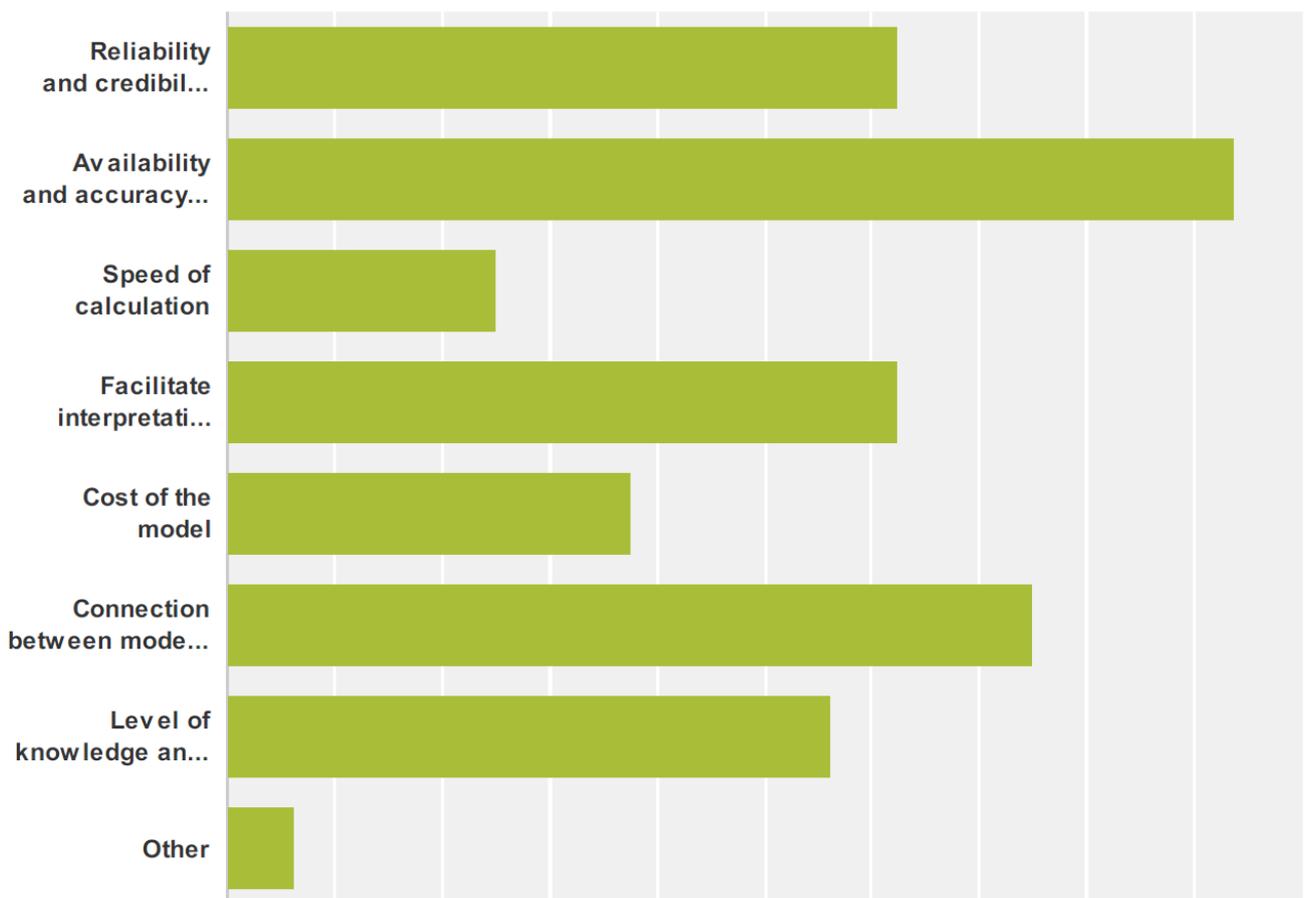


Figure 25. Main areas of improvement of urban models

Conclusions on models and tools

The most commonly used models and decision support tools are GIS tools, Land Use and LUTI models and transport models. They are mainly developed in house and in house + consultancy.

Depending on the kind of model, different input and output land use attributes are considered. Spatially explicit and mobility infrastructure properties, such as mobility infrastructure (roads, public transport, cycling, etc.), residential building density, public space, and parks and/or green space seem to be the most common land use properties integrated in the models. Economic, environmental and/or individual social characteristics are integrated to a lesser degree. Human qualities, accessibility to labor force, rental vs. ownership in housing are less commonly integrated in the models.

Most of the modellers obtain internally the data used to feed the models. Other data are obtained free of charge or purchased by external providers. Some of the main problems encountered by modellers related to data acquisition are the accessibility and cleanness of data. Data mining techniques, which contribute to mitigate some of these issues, are very little used in practice.

The acceptance of a model as a decision support tool encompasses many different aspects, such as easiness of use and interpretation, transferability, time of calculations, etc. Practitioners and modellers participating in this survey considered that the most relevant aspects are the following: data sources compatibility, visualisation support and interoperability. Multiple interfacing capability, Software Development Kits (SDK) support, and multiple output generation are considered less relevant.

Regarding the use of models and decision support tools in the policy making process, the stages of the policy cycle in which the models are most commonly implemented (even if at a very basic level) are: stakeholder consultation; coordination; and evaluation. They are less used (even when in some cases its implementation is considered to be beneficial) in the analysis and evaluation of threats and opportunities, as well as in issue specification and agenda setting (selection of issues to be tackled).

Inputs and experience coming from different stakeholders involved in the process of urban development may facilitate the process of models design and calibration. According to practitioners participating in these surveys, the stakeholders groups that are more frequently involved in the process of model design/definition/calibration are private companies and environmental associations, while trade unions and employers organisations are the least involved.

With respect to the perception of modellers about the main areas for improvement in urban modelling, more than 90% consider that the availability and accuracy of input data is a problem that needs to be solved. More than 70% think, in agreement with the results of the policy makers' survey, that the realism of the scenarios contemplated by the models should be improved. Other aspects, such as cost or speed of calculation, are considered less relevant.

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Annex I. Abbreviations and acronyms

Code	Country
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom

Annex II. List of cities considered for each country

Geographical region	Country Code	Metropolitan area (1)	Type (2)
Northern	DK	København	1
Northern	DK	Fyn	2
Northern	DK	Østjylland	2
Northern	DK	Nordjylland	2
Northern	EE	Põhja-Eesti	1
Northern	FI	Uusimaa (Helsinki)	1
Northern	FI	Varsinais-Suomi	2
Northern	FI	Pirkanmaa	2
Northern	IE	Dublin	1
Northern	IE	South-West (Cork)	2
Northern	LT	Vilniaus apskritis	1
Northern	LT	Kauno apskritis	2
Northern	LV	Rīga	1
Northern	SE	Stockholms län	1
Northern	SE	Skåne län	2
Northern	SE	Västra Götalands län	2
Northern	UK	London	1
Northern	UK	Northumberland	2
Northern	UK	Tyneside	2
Northern	UK	Manchester	2
Northern	UK	East Merseyside	2
Northern	UK	Liverpool	2
Northern	UK	Sefton	2
Northern	UK	Wirral	2
Northern	UK	Barnsley, Doncaster and Rotherham	2
Northern	UK	Sheffield	2
Northern	UK	Bradford	2
Northern	UK	Leeds	2
Northern	UK	Calderdale, Kirklees and Wakefield	2
Northern	UK	East Derbyshire	2
Northern	UK	Birmingham	2
Northern	UK	Solihull	2
Northern	UK	Dudley and Sandwell	2
Northern	UK	Walsall and Wolverhampton	2
Northern	UK	East Dunbartonshire, West Dunbartonshire and Helensburgh & Lomond	2
Northern	UK	Glasgow City	2
Northern	UK	Inverclyde, East Renfrewshire and Renfrewshire	2

Geographical region	Country Code	Metropolitan area (1)	Type (2)
Northern	UK	Lanarkshire	2
Southern	CY	Kýpros / Kibris	1
Southern	ES	Madrid	1
Southern	ES	Barcelona	2
Southern	ES	Valencia / València	2
Southern	ES	Sevilla	2
Southern	GR	Attiki	1
Southern	GR	Thessaloniki	2
Southern	HR	Zagreb	1
Southern	HR	Splitsko-dalmatinska županija	2
Southern	IT	Roma	1
Southern	IT	Torino	2
Southern	IT	Novara	2
Southern	IT	Varese	2
Southern	IT	Como	2
Southern	IT	Lecco	2
Southern	IT	Milano	2
Southern	IT	Bergamo	2
Southern	IT	Pavia	2
Southern	IT	Lodi	2
Southern	IT	Napoli	2
Southern	MT	Malta	1
Southern	PT	Grande Lisboa	1
Southern	PT	Grande Porto	2
Southern	SI	Osrednjeslovenska	1
Southern	SI	Podravska	2
Eastern	BG	Sofia (stolitsa)	1
Eastern	BG	Varna	2
Eastern	BG	Plovdiv	2
Eastern	CZ	Hlavní město Praha	1
Eastern	CZ	Jihomoravský kraj	2
Eastern	CZ	Moravskoslezský kraj	2
Eastern	HU	Budapest	1
Eastern	HU	Borsod-Abaúj-Zemplén	2
Eastern	HU	Hajdú-Bihar	2
Eastern	PL	Warszawa	1
Eastern	PL	Miasto Łódź	2
Eastern	PL	Łódzki	2
Eastern	PL	Miasto Kraków	2
Eastern	PL	Krakowski	2

Geographical region	Country Code	Metropolitan area (1)	Type (2)
Eastern	PL	Rybnicki	2
Eastern	PL	Bytomski	2
Eastern	PL	Gliwicki	2
Eastern	PL	Katowicki	2
Eastern	PL	Sosnowiecki	2
Eastern	PL	Tyski	2
Eastern	PL	Miasto Poznań	2
Eastern	PL	Poznański	2
Eastern	PL	Miasto Wrocław	2
Eastern	PL	Wrocławski	2
Eastern	PL	Trójmiejski	2
Eastern	PL	Gdański	2
Eastern	RO	Bucureşti	1
Eastern	RO	Cluj	2
Eastern	RO	Iaşi	2
Eastern	RO	Constanţa	2
Eastern	RO	Dolj	2
Eastern	RO	Timiş	2
Eastern	SK	Bratislavský kraj	1
Eastern	SK	Košický kraj	2
Western	AT	Wien	1
Western	AT	Linz-Wels	2
Western	BE	Arr. de Bruxelles-Capitale / Arr. van Brussel-Hoofdstad	1
Western	BE	Arr. Antwerpen	2
Western	BE	Arr. Liège	2
Western	DE	Berlin	1
Western	DE	Stuttgart, Stadtkreis	2
Western	DE	Böblingen	2
Western	DE	Esslingen	2
Western	DE	Göppingen	2
Western	DE	Ludwigsburg	2
Western	DE	Rems-Murr-Kreis	2
Western	DE	München, Kreisfreie Stadt	2
Western	DE	Bad Tölz-Wolfratshausen	2
Western	DE	Dachau	2
Western	DE	Ebersberg	2
Western	DE	Erding	2
Western	DE	Freising	2
Western	DE	Fürstenfeldbruck	2
Western	DE	Landsberg a. Lech	2

Geographical region	Country Code	Metropolitan area (1)	Type (2)
Western	DE	München, Landkreis	2
Western	DE	Starnberg	2
Western	DE	Aschaffenburg, Kreisfreie Stadt	2
Western	DE	Aschaffenburg, Landkreis	2
Western	DE	Hamburg	2
Western	DE	Darmstadt, Kreisfreie Stadt	2
Western	DE	Frankfurt am Main, Kreisfreie Stadt	2
Western	DE	Offenbach am Main, Kreisfreie Stadt	2
Western	DE	Wiesbaden, Kreisfreie Stadt	2
Western	DE	Darmstadt-Dieburg	2
Western	DE	Groß-Gerau	2
Western	DE	Hochtaunuskreis	2
Western	DE	Main-Kinzig-Kreis	2
Western	DE	Main-Taunus-Kreis	2
Western	DE	Offenbach, Landkreis	2
Western	DE	Rheingau-Taunus-Kreis	2
Western	DE	Wetteraukreis	2
Western	DE	Harburg	2
Western	DE	Stade	2
Western	DE	Düsseldorf, Kreisfreie Stadt	2
Western	DE	Duisburg, Kreisfreie Stadt	2
Western	DE	Essen, Kreisfreie Stadt	2
Western	DE	Krefeld, Kreisfreie Stadt	2
Western	DE	Mönchengladbach, Kreisfreie Stadt	2
Western	DE	Mülheim an der Ruhr, Kreisfreie Stadt	2
Western	DE	Oberhausen, Kreisfreie Stadt	2
Western	DE	Remscheid, Kreisfreie Stadt	2
Western	DE	Solingen, Kreisfreie Stadt	2
Western	DE	Wuppertal, Kreisfreie Stadt	2
Western	DE	Mettmann	2
Western	DE	Rhein-Kreis Neuss	2
Western	DE	Wesel	2
Western	DE	Bottrop, Kreisfreie Stadt	2
Western	DE	Gelsenkirchen, Kreisfreie Stadt	2
Western	DE	Recklinghausen	2
Western	DE	Bochum, Kreisfreie Stadt	2
Western	DE	Dortmund, Kreisfreie Stadt	2
Western	DE	Hagen, Kreisfreie Stadt	2
Western	DE	Hamm, Kreisfreie Stadt	2
Western	DE	Herne, Kreisfreie Stadt	2

Geographical region	Country Code	Metropolitan area (1)	Type (2)
Western	DE	Ennepe-Ruhr-Kreis	2
Western	DE	Unna	2
Western	DE	Herzogtum Lauenburg	2
Western	DE	Pinneberg	2
Western	DE	Segeberg	2
Western	DE	Stormarn	2
Western	FR	Paris	1
Western	FR	Nord	2
Western	FR	Gironde	2
Western	FR	Haute-Garonne	2
Western	FR	Rhône	2
Western	FR	Bouches-du-Rhône	2
Western	LU	Luxembourg (Grand-Duché)	1
Western	NL	Amsterdam	1
Western	NL	Agglomeratie 's-Gravenhage	2
Western	NL	Delft en Westland	2
Western	NL	Groot-Rijnmond (Rotterdam)	2
Western	NL	Zuidoost-Zuid-Holland	2

(1) Metropolitan areas are named after the NUT 3 (2006) region they belong to. In some cases, the name of the main city has been added in brackets for clarification.

(2) Classification:

0 - Other regions (not shown in table)

1 - Capital city region

2 - Second tier metro region

3 - Smaller metro region (not shown in table)

Annex III. Questionnaires

Policy Makers Questionnaire

INTRODUCTION

Welcome to the INSIGHT stakeholder questionnaire. The INSIGHT consortium sincerely appreciates your participation.

INSIGHT is a research project funded under the European Union's Seventh Framework Program that investigates how ICT (Information and Communication Technologies), with particular focus on data science and urban simulation, can help European cities formulate and evaluate policies to stimulate a balanced economic recovery and a sustainable urban development. More information about the project is available at: <http://www.insight-fp7.eu>.

The objective of this questionnaire is to investigate the role of ICT in the process of urban planning, and to understand the needs of policy makers in relation to supporting data and decision support tools. The purpose is to identify the gap between available models and tools and policy makers' needs, in order to define relevant research topics to bridge this gap.

The questionnaire is divided into 5 sections:

- Sustainable Urban Development Objectives
- Indicators
- Policies and Measures
- Procedures and Governance
- Models and Decision Support Tools

Length and privacy information:

- This questionnaire will require approximately 20 minutes of your time.
- Your identity will not be revealed.
- The questionnaire will be analysed by INSIGHT partners only.
- Written reports and publications will be prepared based on the analysis of the questionnaires. Should you be interested in this possibility, you will be provided with a copy of these reports.

If you have any question or any problem answering the questionnaire, please don't hesitate to contact us:

Contact person: Oliva Garcia Cantu Ros (Nommon Solutions and Technologies)

E-mail: oliva.garcia-cantu@nommon.es

CONTACT DETAILS

* 1. Contact details

Name:	<input type="text"/>
Organisation:	<input type="text"/>
Position:	<input type="text"/>
City/Town:	<input type="text"/>
State/Province:	<input type="text"/>
Country:	<input type="text"/>

Section 1: SUSTAINABLE URBAN DEVELOPMENT OBJECTIVES

Sustainable urban development may be defined as a process of synergetic integration and co-evolution of the environmental, social and economic dimensions which guarantees the local population a non-decreasing level of wellbeing in the long term, without compromising the possibilities of development of surrounding areas and reducing the harmful effects of development on the biosphere. Transverse to these three dimensions is good governance and citizens participation.

Considering the previous explanation please respond to the next questions:

2. Has your city been recently (during the last 5 years) involved or is currently involved in any kind of urban planning activity?

Yes

No

3. What were/are the drivers for this?

- Legal requirement
- Other factors

Section 1: SUSTAINABLE URBAN DEVELOPMENT OBJECTIVES

4. Which are these factors? More than one answer is possible

- Electoral commitment of the ruling party
- Proposal from influential stakeholders
- Special cultural/economic projects (e.g. Olympic projects, etc.)
- Obsolescence of current plan
- Required action from a different sector of the public administration

Other (please specify)

5. Has your city established a specific list of objectives related to sustainable urban development?

- Yes
- No

Section 1: SUSTAINABLE URBAN DEVELOPMENT OBJECTIVES

6. Which documents do formally establish the main urban development objectives of your city? More than one answer is possible

- General Urban Plan
- Strategy on Infrastructure (road, transport, energy, water, sanitation)
- Air Quality Plan
- Energy and Climate Change Strategy
- Urban Mobility Plan
- Local Agenda 21
- Economic Development Strategy (trade, industrial parks, clusters, tourism...)
- Electoral program of the ruling party (or ruling parties when in coalition or pact)
- Other (please specify)

***7. Which are main objectives of your city? Maximum 7 responses**

- Competitiveness in the global economy
- Local economy, focusing on promoting resilient sustainable economies / economic diversity
- Industry development and job creation
- Innovation, new technologies development and job creation
- Services development and job creation
- Trade development and job creation
- Tourism development and job creation
- Economic efficiency in the provision of public services
- Liveable streets and neighbourhoods
- Cultural heritage preservation/improvement
- Human capital development
- Cultural offer enhancement
- Equity and social inclusion, including reduction of spatial segregation
- Safety
- Security
- Stop demographic decline
- Reduce energy consumption (specially from non-renewable sources)
- Reduce contribution to climate change
- Reduce air pollution
- Reduce noise pollution
- Reduce water pollution
- Reduce urban sprawl and land take for transport and settlement purposes
- Increase citizens' participation
- Integrated platforms for public services provision
- Transparency, including open data.

Other (please specify)

Section 2: INDICATORS

Indicators are a useful tool for controlling and monitoring processes. In some cases it is difficult to measure or obtain outcome indicators; in this case intermediate indicators are used to calculate (or obtain a proxy) output indicators.

Considering the previous explanation please respond to the next questions:

8. Does your city have a specific list of outcome indicators for Urban Development?

- No, there is not any list of outcome indicators
- There is a list of outcome indicators but the relation with the corresponding objectives is not clear
- There is a specific list of outcome indicators clearly related with the objectives

Please indicate below the document in which these indicators are specified

9. Does your city have a specific list of intermediate indicators for Urban Development?

- No, there is not any list of intermediate indicators
- There is a list of intermediate indicators but the relation with the corresponding outcome indicators is not clear
- There is a specific list of intermediate indicators clearly related with the outcome indicators

Please indicate below the document in which these indicators are specified

10. Do you use (even if in an informal way) any kind of comparative international indicator system about sustainable urban development (e.g the Global City Indicators Facility)?

- No
- Yes (Please indicate below which one/s)

Section 2: INDICATORS

11. For the following list of indicators please assess their relevance to measure Economic Sustainability objectives, from "not relevant" to "very relevant"

	not relevant			very relevant
Number of Businesses per 1000 Population	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Household budget and GDP per capita	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
% unemployment rate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job creation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Industrial production index	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consumer Price Index (CPI)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Foreign direct investment (FDI)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Export of goods and services (% of GDP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visitor expenditures (% of GDP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Land prices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N° of unoccupied flats or buildings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of congestion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Average time spent travelling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

12. For the following list of indicators please assess their relevance to measure Social Sustainability objectives, from "not relevant" to "very relevant"

	not relevant			very relevant
N° of vulnerable users injured by traffic accidents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N° of traffic accidents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Traffic accidents with casualties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fatalities occurred in traffic accidents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Space for pedestrian use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Percentage of streets with the minimum safety and quality standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Traffic light cycle length	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Length of bicycle lanes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Road land occupation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessibility of green areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supply of public transport services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of the budget devoted to fundamental needs: housing, nutrition, health, education and transport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Essential services supply in each zone (hospitals, educational centres and stores)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Number of crime offenses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of active population	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of population over 60 years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of population under 25	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Share of skilled workers

Migration tendencies

High school and university completion rates

Diversity of education degrees offer

Cultural offer and cultural demand (museums, cinema, libraries, theatre, concerts...)

Other (please specify)

13. For the following list of indicators please assess their relevance to measure Environmental Sustainability objectives from "not relevant" to "very relevant"

	not relevant			very relevant
Energy consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of energy consumption by sector (transport, industry, residential, services...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of energy consumption coming from renewable sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhouse Gases Emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of Greenhouse Gases Emissions by sector (transport, industry, waste...)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rate of diseases potentially related to air pollution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Air concentration of NOx and particles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emissions of NOx and particles generated by transport modes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Noise intensity levels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Citizens' perception of noise intensity levels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proportion of population exposed to noise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of the city's wastewater receiving primary, secondary or tertiary treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Urban density	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Land occupied by transport infrastructures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share of the metropolitan area population living in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

the main city

Other (please specify)

Section 3: POLICIES AND MEASURES

In order to achieve the urban development objectives (e.g. reduce global warming emissions) a set of policies has to be established.

14. Which of the following policies/measures related to urban development are implemented in your city? Please indicate the degree of implementation

	Not implemented	Implementation is planned	Partially implemented / Implementation in progress	High degree of implementation
Energy demand management policies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy efficiency policies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote renewables energies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transport demand management policies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water resources and water waste management policies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Material resources and waste management policies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education and awareness rising campaigns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pedestrianisation of historical centres (e.g. retail and cultural areas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote social innovation, creative clusters, technology, access to education in neighbourhoods/communities...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote the integration of business parks in the main city areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improvement, strengthening and competitiveness of industrial areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financing buildings rehabilitation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financing households refurbishment (including appliances renovation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empowerment, participation processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other. Please specify the degree of implementation after the response using brackets, e.g. regulation of commercial opening hours (Implementation is planned)





Section 4: GOVERNANCE AND PROCEDURES

15. At local level: which kind of integration/coordination exists between the departments involved in urban development policies? More than one answer is possible

	Informal	Horizontal	Case by case	Coordination through hierarchical structures ("Councillors Board")	Formal coordination through some management tools (indicator systems)	Formal coordination through some steering group
Occasional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fluent daily interaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other (please specify)

16. Concerning coordination with different administrations (local, regional, national, European): is there any kind of collaborative process or structure in place with the following institutions? More than one answer is possible

- Neighbour City Councils
- Regional Government
- National Government
- European Commission
- None
- Other (please specify)

17. Is there any collaborative process in place with stakeholders (i.e. citizen associations, environmental associations, transport companies, etc.), such as stakeholder consultations, round tables, task forces, etc.?

- No
- Yes. Please specify which kind of collaborative process and which stakeholders are involved

Section 4: GOVERNANCE AND PROCEDURES

18. How often do stakeholders directly participate in policy making regarding urban development?

	Never	Rarely	Occasionally	Frequently	Very Frequently
Chamber of commerce	<input type="radio"/>				
Trade unions	<input type="radio"/>				
Employers organisations	<input type="radio"/>				
Private companies	<input type="radio"/>				
Citizens associations	<input type="radio"/>				
Environmental associations	<input type="radio"/>				

Other. Please specify the frequency of participation of the stakeholder using brackets, e.g. bicycle associations (Rarely).

19. To what degree do you find each of the following stages of the policy cycle problematic in the delivery of urban development strategies?

	Not at all problematic	Not very problematic	Fairly problematic	Very problematic
Problem formulation and issue identification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stakeholder consultations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analysis and evaluation of threats and opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Issue specification and agenda setting (selection of issues to be tackled)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Policy formulation (analysis of policy alternatives and selection of policies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Policy instrument design and development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coordination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussion / Debate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decision / Approval	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluation / Assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 5: URBAN POLICY MODELS AND OTHER DECISIONS SUPPORT TOOLS

Urban models and ICT can be used as tools to create representation of the 'real world' helping to analyse hypothetical scenarios and new policies' effects.

Urban models are analytical and/or predictive representations —sometimes implemented through computational simulation tools— that describe, explain, and forecast the behaviour of and interactions between different elements of the urban system.

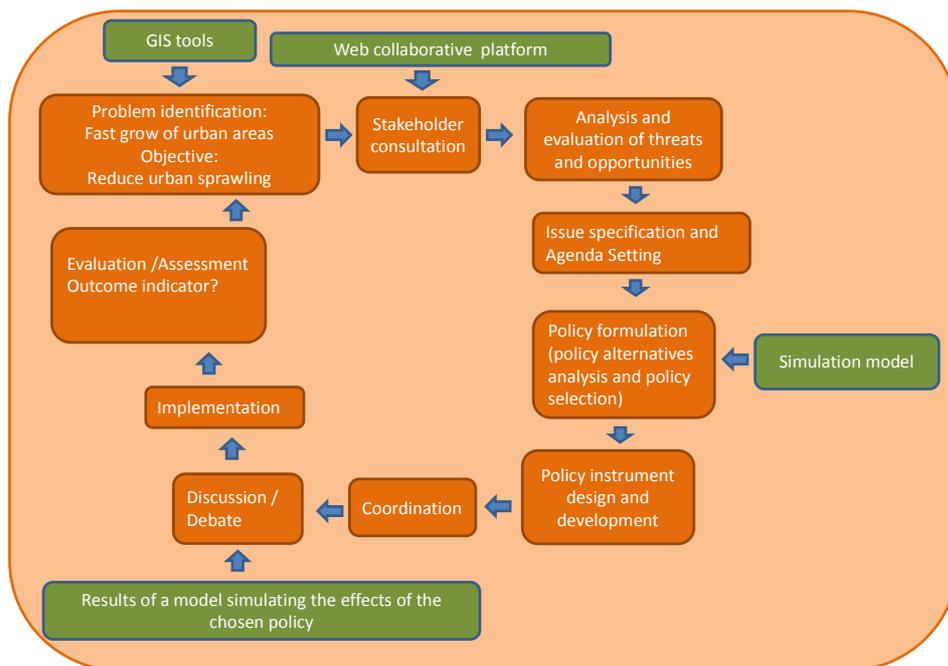
These models serve various functions, such as:

- Provide optimal solutions for location decisions
- Enable virtual experimentation allowing the prediction of the impact of new policies
- Ease decision-making as different alternatives become visible and measurable
- Facilitate participatory processes for collaborative decision making with stakeholders.

When we speak of "other ICT tools to support decision making in urban planning" we are referring, for example, to:

- 3D visualization
- GIS
- Web-based collaborative platforms
- ...

The figure below shows an example of how the policy cycle is assisted with an urban simulation model and with other ICT decision support tools.



Considering the previous example please respond to the next questions:

20. How often are urban models used in your city to evaluate the potential impact of future policies?

- Very Frequently
- Frequently
- Occasionally
- Rarely
- Never

Please specify some examples (if any) of policies in your city that have been evaluated using models.

21. Please, indicate in which parts of the policy cycle (if any) are urban simulation models and other ICT tools used in your city, they are partially used or you think they should be used

	Used in your city	Implemented at a very basic level	Are not used but it would be beneficial	Are not used because they are not relevant
Problem formation and issue identification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stakeholder consultations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analysis and evaluation of threats and opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Issue specification and agenda setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Policy formulation (analysis of policy alternatives and selection of policies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Policy instrument design and development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussion / Debate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decision / Approval	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaluation / Assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. Based on your experience, specify the degree in which the modelling results influence policy decisions?

- They are usually not taken into account
- They are taken into account but other criteria usually prevail
- They are an essential part of the decision making process

***23. In your opinion, which are the main areas for improvement in relation to urban modelling and simulation? Multiple choice is possible**

- Reliability and credibility of model results
- Availability and accuracy of input data
- Speed of calculation
- Facilitate interpretation of results
- Cost of the model
- Connection between model and real scenarios
- Level of knowledge and skills required to use them
- Continuous dependence on software provider
- Other

Please specify

24. Thank you again for your participation!

Please indicate below whether:

- You would not mind if researchers contact you to collaborate in future studies related with the project
- You would like to receive a copy of the INSIGHT technical report analysing the survey results

If you have chosen any of the previous answers please specify an e-mail account to contact you

Modellers Questionnaire

INTRODUCTION

Welcome to the INSIGHT stakeholder questionnaire. The INSIGHT consortium sincerely appreciates your participation.

INSIGHT is a research project funded under the European Union's Seventh Framework Program that investigates how ICT (Information and Communication Technologies), with particular focus on data science and urban simulation, can help European cities formulate and evaluate policies to stimulate a balanced economic recovery and a sustainable urban development. More information about the project is available at: <http://www.insight-fp7.eu>.

The objective of this questionnaire is to investigate the role of ICT in the process of urban planning, and to understand the needs of policy makers in relation to supporting data and decision support tools. The purpose is to identify the gap between available models and tools and policy makers' needs, in order to define relevant research topics to bridge this gap.

The questionnaire is divided into 3 sections:

- Affiliation, Competences and Responsibilities
- Procedures and Governance
- Models and Decision Support Tools

Length and privacy information:

- This questionnaire will require approximately 10 minutes of your time.
- Your identity will not be revealed.
- The questionnaire will be analysed by INSIGHT partners only.
- Written reports and publications will be prepared based on the analysis of the questionnaires. Should you be interested in this possibility, you will be provided with a copy of these reports.

If you have any question or any problem answering the questionnaire, please don't hesitate to contact us:

Contact person: Oliva Garcia Cantu Ros (Nommon Solutions and Technologies)

E-mail: oliva.garcia-cantu@nommon.es

CONTACT DETAILS

* 1. Contact details

Name:	<input type="text"/>
Organisation:	<input type="text"/>
Position:	<input type="text"/>
City/Town:	<input type="text"/>
State/Province:	<input type="text"/>
Country:	<input type="text"/>

Section 1: AFFILIATION, COMPETENCES AND RESPONSIBILITIES

2. Which kind of organisation do you work for? More than one answer is possible

- Public administration
- Private consultancy / engineering / architecture firm
- Academic / research institution

Section 1: AFFILIATION, COMPETENCES AND RESPONSIBILITIES

3. In which way does your organisation participate in Urban Planning processes?

- We work in close collaboration with urban planning authorities
- We collaborate in specific projects with urban planning authorities
- We seldom collaborate with urban planning authorities

Section 1: AFFILIATION, COMPETENCES AND RESPONSIBILITIES

4. Does your department collaborate with other departments of the administration related with urban development (e.g. health, environment or transport department)?

No

Yes

which one/s and to what degree

5. Does your organisation/departement collaborate in any way with other private and/or academic Urban Planning agents?

Yes, we often collaborate in joint projects

We have some occasional collaborations

We seldom collaborate with other agents

6. Which field related to urban planning process is your organisation focused on? More than one answer is possible

Mobility and transport planning

Management of infrastructure and services

Land use planning at territorial level

Development of detailed urban land use plans

Definition of urban regeneration policies at a district or neighbourhood scale

Economics

Other (please specify)

Section 2: GOVERNANCE AND PROCESSES

7. To what extent do you think that technicians, urban planners and decision makers work in an integrated way?

- Not at all
- We seldom communicate or work in an integrated way
- We collaborate in specific occasions but collaboration is insufficient
- We work in close collaboration

Section 3: MODELS AND TOOLS

Urban models and ICT can be used to create representation of the 'real world' helping to analyse hypothetical scenarios and new policies' effects.

Urban models are mathematical representations —typically implemented through computational simulation tools— that describe, explain, and forecast the behaviour of and interactions between different elements of the urban system.

These models serve various functions, such as:

- Enable virtual experimentation allowing the prediction of the impact of new policies
- Ease decision-making as different alternatives become visible and measurable
- Facilitate participatory processes for collaborative decision making with stakeholders.

When we speak of "other ICT tools to support decision making in urban planning" we are referring, for example, to:

- 3D visualisation
- GIS
- Web-based collaborative platform

8. Which kind of models do you work with? How are they developed?

	In house development	In house development + Consultants	Open source	Commercial tool	I do not know
Location - Allocation models of urban facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LUTI / Land Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel demand models	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic models	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visualisation tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GIS tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ICT tools for public participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If any of the above mentioned tools are commercial or open source please indicate below (e.g GIS: QGIS)

9. If you use any other type of model or tool which is not reflected above, please add it below indicating the name and the source (Open source, Commercial tool)

Section 3: MODELS AND TOOLS

10. Which land use attributes are included as input/output parameters in your models/tools?

- Population development
- Residential building density
- Non-residential/office building density
- Rental vs. Ownership in housing
- Mixed use development
- Mobility infrastructure (roads, public transport, cycling, etc.)
- Public services
- Cultural heritage
- Public space, parks and/or green space
- Future (expected) demand for residential space
- Risks (e.g. flooding, etc.)
- Air quality
- Noise
- Human qualities (e.g. attractiveness, safety, etc.)
- Land or building market value
- Property/cadastral structure
- Policy and planning strategies
- Accessibility to labour force
- Accessibility to work place
- Transport accessibility: roads
- Transport accessibility: public transport
- Transport accessibility: cycling infrastructure

Other (please specify)

11. How do you get access to the data processed by the model? More than one answer is possible

- The data is available free of charge
- The data is purchased from external providers
- The data is available internally
- Using data mining techniques on alternative data sources (mobile phones, smart meters, etc.)

Other (please specify)

12. In your opinion what are the main problems modellers encounter related to data provision? More than one answer is possible

- Accessibility to data
- Cleanness of data
- Data is not collected ad-hoc for the models and has to be mined from other sources
- Privacy issues with personal data

Other (please specify)

13. Please evaluate the importance of following technical aspects of models and tools

	not important at all	not very important	important	very important
Architecture framework robustness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Architectural improvement flexibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data sources compatibility / Data types supported	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Databases storage capacity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data analysis efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interoperability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hardware requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scalability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multiple interfacing capability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visualisation support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of accessibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Robustness of Data Base Management System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multiple output generation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SDK (Software Development Kits) support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Skills required to use the tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Processing time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 3: MODELS AND TOOLS

14. Please indicate in which parts of the policy cycle (if any) are urban simulation models and/or other ICT tools used in your city. Multiple choice is possible

	Used in your city	Implemented at a very basic level	Are not used but it would be beneficial	Are not used because they are not relevant
Problem formulation and issue identification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stakeholder consultations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analysis and evaluation of threats and opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Issue specification and agenda setting (selection of issues to be tackled)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Policy formulation (analysis of policy alternatives and selection of policies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Policy instrument design and development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussion / Debate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decision / Approval	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaluation / Assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. How often stakeholders directly participate in the design/definition/calibration of the models?

	Never	Rarely	Occasionally	Frequently	Very Frequently
Citizen associations	<input type="radio"/>				
Environmental associations	<input type="radio"/>				
Private companies	<input type="radio"/>				
Chamber of commerce	<input type="radio"/>				
Trade unions	<input type="radio"/>				
Employers organisations	<input type="radio"/>				

Other (please specify)

***16. In your opinion, which are the main areas for improvement in relation to urban modelling?**

- Reliability and credibility of model results
- Availability and accuracy of input data
- Speed of calculation
- Facilitate interpretation of results
- Cost of the model
- Connection between model and real scenarios
- Level of knowledge and skills required to use them
- Other

Please specify

17. Thank you again for your participation!

Please indicate below whether:

- You would not mind if researchers contact you to collaborate in further studies related with the project.
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If you have chosen any of the previous answers please specify an e-mail account to contact you