IESE Cities in Motion Index

2019

IESE Business School
University of Navarra

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We gratefully acknowledge the financial support of the Agencia Estatal de Investigación (AEI) of the Ministry of Economy and Competitiveness—ECO2016-79894-R (MINECO/FEDER), the Schneider-Electric Sustainability and Business Strategy Chair, the Carl Schroeder Chair in Strategic Management and the IESE's High Impact Projects initiative (2017/2018).

DOI: https://dx.doi.org/10.15581/018.ST-509

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Foreword

Once again, we are pleased to present a new edition (the sixth) of our *IESE Cities in Motion Index* (**CIMI**). Over the past years, we have observed how various cities, companies and other social actors have used our study as a benchmark when it comes to understanding the reality of cities through comparative analysis.

As in every edition, we have tried to improve the structure and coverage of the **CIMI** and this, the sixth edition, has been no exception. As in the previous editions, we have tried to provide an index that is objective, comprehensive, wide-ranging and guided by the criteria of conceptual relevance and statistical rigor. However, this edition features some different elements with respect to the others. The first important difference is that we have significantly increased the number of variables in relation to the cities. This edition includes a total of 96 indicators (13 more than in the previous edition), which reflect both objective and subjective data and offer a comprehensive view of each city. Among the new variables, there are, for example, the hourly wage, purchasing power, mortgage as a percentage of income, and whether a city is a favorable environment for the development of women. In our opinion, this increase in the quantity and quality of the variables used allows for a more accurate assessment of the reality of the cities that appear in the **CIMI**.

A second difference is reflected in our effort to widen the geographical coverage, which has resulted in the analysis of a greater number of cities than in the previous edition: we cover a total of 174 cities (79 of them capitals), which represent 80 countries. In this regard, 11 new cities have been added, notably Quebec (Canada), Edinburgh (United Kingdom) and Denver and Seattle (United States). The breadth and scope of the **CIMI** establish it as one of the city indexes with the widest geographical coverage existing today. On the website citiesinmotion.iese.edu/indicecim/?lang=en, the data about each of the cities can be consulted in an interactive way and two cities can be compared at the same time.

As in the previous edition, we have merged two dimensions of our conceptual model, which originally took into account 10 key dimensions: human capital, social cohesion, the economy, public management, governance, the environment, mobility and transportation, urban planning, international outreach, and technology. We have kept governance and public management in a single category ("governance") for two fundamental reasons: in the first place, because there is a certain overlapping between both dimensions that makes it difficult to distinguish between them conceptually and, secondly, because the limited number of city-related indicators that cover each of these dimensions led us to join them together so we have a more reliable measure. We believe that this change does not significantly affect the conclusions of the **CIMI** but rather it strengthens them. In any case, we continue to strive to obtain more and better indicators that will capture these dimensions.

These differences with respect to previous editions oblige us to remind the reader that the rankings are not directly comparable from one year to another. The inclusion of new cities and new indicators produces variations that do not necessarily reflect the trajectory of the cities over time. To be able to study the evolution of the cities, in each edition we analyze the trend of the cities by calculating the index of the previous three years, which allows us to make more appropriate comparisons.

We see this index as a dynamic project and therefore we continue to work so that the future editions of the index will have better indicators for all the dimensions and give wider coverage, as well as a growing analytical and predictive value. In this respect, your comments and suggestions are always welcome as they will enable us to progress, and we invite you to contact us via the channels you will find on our website: www.iese.edu/cim.

Likewise, we would like to inform our readers that our efforts here at the IESE Cities in Motion platform have not been limited to just ranking cities but we have continued to publish our series of minibooks in English, which identify good practices in each of the dimensions of the IESE Cities in Motion model. Currently there are four publications available on Amazon about the dimensions

of the environment, mobility and transportation, the economy, and social cohesion, while the next volume will be devoted to international outreach and shortly this collection will be expanded to cover the rest of the dimensions.

Moreover, new case studies have been published in addition to those that already exist about Vancouver ("Vancouver: The Challenge of Becoming the Greenest City"), Barcelona ("Barcelona: A Roman Village Becoming a Smart City") and Málaga ("Málaga: In Search of Its Identity as a Smart City"). During this academic year, moreover, we have added a case about the city of Medellín, which has the title "Medellín: Transformation Toward a More Equitable, Innovative and Participatory Urban Society." These documents are available on the IESE case study portal (www.iesepublishing.com), and there will be new cases available shortly, including one about the city of Singapore and its digital identity project. This new teaching material has allowed us to consolidate our courses linked to cities in both IESE programs and those undertaken in collaboration with other schools and institutions.

In parallel, we continue to work on a series of academic papers, especially focused on the Sustainable Development Goals (SDGs) adopted by the United Nations in urban contexts. We hope that these publications will soon be added to other articles already published in prestigious journals such as the *Academy of Management Journal, the California Management Review and the Harvard Deusto Business Review*.* We have also strengthened the presence of the IESE Cities in Motion platform on the Internet with our Twitter account (@iese_cim) and our monthly posts on the IESE Cities in Motion blog (blog.iese.edu/cities-challenges-and-management). Finally, it is worth highlighting our participation in various projects, such as GrowSmarter, financed by the European Commission (www.grow-smarter.eu/home), or the technical guide about public-private partnerships (PPPs) that we have produced with the CAF-Development Bank of Latin America. This guide can be acquired free of charge (scioteca.caf.com/handle/123456789/1179) and it is complemented by a series of explanatory videos (www.ieseinsight.com/doc.aspx?id=2165&idioma=1).

We regard both our publications and our presence in cyberspace as being the ideal complements of this index as they contribute to a better understanding of the reality of cities. Therefore, we believe that it will be useful for those in charge of making cities better environments in which to live, work and enjoy life. Urban managers face significant obstacles such as difficulties in mobility, aging populations, increases in inequality, the persistence of poverty and pollution, among many others. Their scope and magnitude demonstrate the need for all of the world's cities to carry out a strategic review process that covers: what type of city they want to be, what their priorities are, and what changes they should undertake in order to take advantage of the opportunities—and minimize the threats—of urbanization. Therefore, our effort focuses on the concept of smart governance. This report is our modest contribution to advancing this process. We are convinced that we can live in better cities, but this will be possible only if all the social actors—the public sector, private companies, civic organizations and academic institutions—actively participate and collaborate to achieve this common goal.

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*You will find a complete list of publications on our website: www.iese.edu/cim.

About Us

IESE Cities in Motion is a research platform launched jointly by the Center for Globalization and Strategy and IESE Business School's Department of Strategy.

The initiative connects a global network of experts in cities, specialist private companies and local governments from around the world. The aim is to promote changes at the local level and to develop valuable ideas and innovative tools that will lead to more sustainable and smarter cities.

The platform's mission is to promote the Cities in Motion model, with an innovative approach to city governance and a new urban model for the 21st century based on four main factors: sustainable ecosystem, creative activities, equality among citizens, and connected territory.

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Introduction: The Need for a Global Vision

Today more than ever, cities need to develop strategic planning processes, since only then can they outline paths toward innovation and prioritize the aspects that are most important for their future.

This process should be participatory and flexible, and a central aim must be established: to define a sustainable action plan that will make the metropolis unique and renowned. Just as two companies do not have the same recipe for success, each city must look for its own model based on a series of common reflections and considerations.

Experience shows that large cities must eschew short-termism and broaden their field of view, as well as turn to innovation more frequently to improve the efficiency and sustainability of their services. Also, they should promote communication and ensure that the public and businesses are involved in their projects.

The time has come to practice smart governance that takes into account all the factors and all the social actors, with a global vision. In fact, over the past few decades, various national and international organizations have produced studies focusing on the definition, creation and use of indicators with a variety of aims, although mainly that of contributing to a diagnosis of the state of cities. The definition of the indicators and the process of their creation are the result of the characteristics of each study and of the statistical and econometric techniques that best fit the theoretical model and the available data, as well as the analysts' preferences.

Today we have a great deal of "urban" indicators, although many of them are neither standardized nor consistent and they cannot be used to compare cities. Actually, despite numerous attempts to develop city indicators at a regional, national and international level, few have been sustainable in the medium term as, in some cases, they were created for studies meant to cover the specific information needs of certain bodies, whose life span depended on how long the financing would last and, in other cases, the system of indicators depended on a political desire in specific circumstances, so they were abandoned when political priorities or the authorities themselves changed. As for the indicators developed by international organizations, it is true that they strive for the consistency and solidity necessary to compare cities; however, for the most part, they tend to be biased or focused on a particular area (technology, the economy, and the environment, among others).

Taking all this into account, the index that provides this publication with its title, the Cities in Motion Index (**CIMI**), has been designed with the aim of constructing a "breakthrough" indicator—in terms of its completeness, its properties, its comparability, its quality and the objectivity of its information included—that would enable measurement of sustainability with regard to the future of the world's leading cities, as with the quality of life of their inhabitants.

The **CIMI** is intended to help the public and governments to understand the performance of nine fundamental dimensions for a city: human capital, social cohesion, the economy, governance, the environment, mobility and transportation, urban planning, international outreach, and technology. All the indicators are linked with a strategic purpose whose goal is to implement a novel form of local economic development that involves the creation of a global city, the promotion of the entrepreneurial spirit, and innovation, among other aspects.

Each city, unique and unrepeatable, has its own needs and opportunities, so it must design its own plan, set its priorities, and be flexible enough to adapt to changes.

Smart cities generate numerous business opportunities and possibilities for collaboration between the public and private sectors. All stakeholders can contribute, so an ecosystem network must be developed that will involve all of them: members of the public, organizations, institutions, government, universities, experts, research centers, etc.

Networking has its advantages: better identification of the needs of the city and its residents, the establishment of common aims and constant communication among participants, the expansion of learning opportunities, increased transparency, and the implementation of more flexible public policies. As a report by the Organization for Economic Cooperation and Development (OECD) pointed out back in 2001, the network approach allows local policies to be focused on the public.

Private enterprise also has much to gain with this system of networking, given that it can collaborate with the administration in the long term, access new business opportunities, gain a greater understanding of the needs of the local ecosystem, gain greater international visibility and attract talent.

Thanks to its technical expertise and its experience in project management, private enterprise, in collaboration with universities and other institutions, is suited to lead and develop smart city projects. In addition, it can provide efficiency and result in significant savings for public-private partnerships.

Finally, it must not be forgotten that the human factor is fundamental in the development of cities. Without a participatory and active society, any strategy, albeit intelligent and comprehensive, will be doomed to failure. Beyond technological and economic development, it is the inhabitants who hold the key for cities to go from "smart" to "wise." That is precisely the goal to which every city should aspire: that its residents and its rulers deploy all their talent in favor of progress.

To help cities identify effective solutions, we have created an index that integrates nine dimensions in a single indicator and covers 174 cities worldwide. Thanks to its broad and integrated vision, the **CIMI** enables the strengths and weaknesses of each of the cities to be identified.

Our Model: Cities in Motion. Conceptual Framework, Definitions and Indicators

Our platform proposes a conceptual model based on the study of a large number of success stories and a series of in-depth interviews with city leaders, entrepreneurs, academics and experts linked to the development of cities.

This model proposes a set of steps that include diagnosis of the situation, the development of a strategy, and its subsequent implementation. The first step to making a good diagnosis is to analyze the status of the key dimensions, which we will set out below along with the indicators used to calculate the **CIMI**.

Human Capital

The main goal of any city should be to improve its human capital. A city with smart governance must be capable of attracting and retaining talent, creating plans to improve education, and promoting both creativity and research.

Table 1 sets out the indicators used in the human capital dimension, along with descriptions of them, their units of measurement, and the sources of information.

While human capital includes factors that make it more extensive than what can be measured with these indicators, there is international consensus that level of education and access to culture are irreplaceable components for measuring human capital. One of the pillars of human development is this capital and, given that the Human Development Index published annually by the United Nations Development Program (UNDP) includes education and culture as dimensions, it is valid to use these indicators to explain the differences in human capital in a city.

To define this dimension, the **CIMI** includes the 10 variables detailed in **Table 1**. Most of the variables are incorporated into the index with a positive sign due to their contribution to the development of the dimension, the exception being expenditure on education per capita.

To measure access to culture, the number of museums, art galleries and theaters and the expenditure on leisure and recreation are taken into account. These indicators show the city's commitment to culture and human capital. Cities that are considered creative and dynamic on a global level typically have museums and art galleries open to the public, offer visits to art collections, and carry out

Table 1. Human Capital Indicators

No.	Indicator	Description / Unit of measurement	Source
1	Higher education	Proportion of population with secondary and higher education.	Euromonitor
2	Business schools	Number of business schools (top 100).	*Financial Times*
3	Movement of students	International movement of higher-level students. Number of students.	UNESCO
4	Universities	Number of universities in the city that are in the top 500.	QS Top Universities
5	Museums and art galleries	Number of museums and art galleries per city.	OpenStreetMap
6	Schools	Number of public or private schools per city.	OpenStreetMap
7	Theaters	Number of theaters per city.	OpenStreetMap
8	Expenditure on leisure and recreation	Expenditure on leisure and recreation per capita.	Euromonitor
9	Expenditure on leisure and recreation	Expenditure on leisure and recreation. In millions of dollars, according to 2016 prices.	Euromonitor
10	Expenditure on education	Expenditure on education per capita.	Euromonitor

activities aimed at their conservation. The existence of a city's cultural and recreation provision implies greater expenditure on these activities by the population.

Finally, expenditure on education per capita represents what each member of the public spends individually to obtain an appropriate level of education. A high level of expenditure is an indicator that the state's budget allocations for education are insufficient, since they oblige the public to assume that cost in order to gain access to a suitable education. For this reason, this variable is included with a negative sign.

Social Cohesion

Social cohesion is a sociological dimension of cities that can be defined as the degree of consensus among the members of a social group or as the perception of belonging to a common situation or project. It is a measure of the intensity of social interaction within the group. Social cohesion in the urban context refers to the level of coexistence among groups of people with different incomes, cultures, ages, and professions who live in a city. Concern about the city's social setting requires an analysis of factors such as immigration, community development, care of the elderly, the effectiveness of the health system, and public safety and inclusion.

The presence of various groups in the same space and mixing and interaction between them are essential in a sustainable urban system. In this context, social cohesion is a state in which citizens and the government share a vision of a society based on social justice, the primacy of the rule of law, and solidarity. This allows us to understand the importance of policies that foment and reinforce social cohesion based on democratic values.

Table 2 sets out the indicators selected to analyze this dimension, descriptions of them, their units of measurement and the sources of information. This selection seeks to incorporate all the sociological subdimensions of social cohesion, taking into account the different variables available.

The ratio of deaths per 100,000 inhabitants and the crime rate are incorporated with a negative sign when this dimension is created. Furthermore, the health index and the number of public and private hospitals and health centers per city are added with a positive sign, since access to and coverage provided by basic social services help strengthen social cohesion.

Employment, meanwhile, is a fundamental aspect in the societies, to the extent that, according to historical evidence, a lack of it can break the consensus or the implicit social contract. For this reason, the unemployment rate is incorporated with a negative sign in the dimension of social cohesion. With regard to the ratio of women who work in public administration, this is incorporated with a positive sign, since it is an indicator of gender equality in access to government jobs.

The Gini index, calculated on the basis of the Gini coefficient to measure social inequality, assumes a value equal to 0 for situations in which there is a perfectly equitable distribution of income (everyone has the same income)

Table 2. Social Cohesion Indicators

No.	Indicator	Description / Unit of measurement	Source
11	Mortality	Ratio of deaths per 100,000 inhabitants.	Euromonitor
12	Crime rate	Crime rate.	Numbeo
13	Health	Health index.	Numbeo
14	Unemployment	Unemployment rate (number of unemployed out of the workforce).	Euromonitor
15	Gini index	Measure of social inequality. It varies from 0 to 100, with 0 being a situation of perfect equality and 100 that of perfect inequality.	Euromonitor
16	Price of property	Price of property as percentage of income.	Numbeo
17	Female workers	Ratio of female workers in the public administration.	International Labour Organization (ILO)
18	Global Peace Index	An index that measures the peacefulness and the absence of violence in a country or region. The bottom-ranking positions correspond to countries with a high level of violence.	Institute for Economics and Peace
19	Hospitals	Number of public and private hospitals and health centers per city.	OpenStreetMap
20	Happiness index	An index that measures the level of happiness of a country. The highest values correspond to countries that have a higher degree of overall happiness.	World Happiness Index
21	Global Slavery Index	Ranking that considers the proportion of people in a situation of slavery in the country. The countries occupying the top positions in the ranking are those with the highest proportion.	Walk Free Foundation
22	Government response to situations of slavery	This variable measures how the government deals with situations of slavery in the country. The top positions in the ranking indicate countries that have a more effective and comprehensive response.	Walk Free Foundation
23	Terrorism	Number of terrorist incidents by city in the previous three years.	Global Terrorism Database (GTD) of the University of Maryland
24	Female-friendly	The variable seeks to measure whether a city provides a friendly environment for women on a scale of 1 to 5. Cities with a value of 1 have a more hostile environment, while those whose value is 5 are very friendly.	Nomad List
25	Suicides	Suicide rate by city.	Nomad List
26	Homicides	Homicide rate by city.	Nomad List

and it assumes a value equal to 100 when the income distribution is completely unequal (one person hoards all the income to the detriment of all the others). This indicator is included in the dimension with a negative sign, since a greater Gini coefficient has a negative effect on a city's social cohesion.

The Global Peace Index is an indicator that represents the degree of tranquility and peace in a country or region, as well as the absence of violence and war. It includes internal variables such as violence and crime and external ones, such as military spending and the wars in which the country or region is taking part. The countries at the top of the ranking are countries with a low level of violence, so the indicator has a negative relationship with the **CIMI**.

The price of property as a percentage of income is also negatively related since, when the percentage of income to be used to buy a property increases, the incentives to belong to a particular city's society decrease.

With regard to happiness, it is increasingly considered a suitable measure of social progress and has become a goal of government policies. According to the World Happiness Report, people assert they are happy if they have a stable job and are healthy and if there is a more homogeneous distribution of wealth within the country or city where they live. To represent this degree of satisfaction, the happiness index is included in the **CIMI**. This variable is included with a positive sign, since the countries that show themselves to be "happiest" (with high values in the index) are those that pay special attention to freedom,

employment, health care, income and good governance. Thus, the happiness of a country or city would also be reflected in greater social coexistence.

The proportion of people enduring slavery and the measures that governments take to respond to this type of crime are incorporated with a negative sign in the ranking, since they do not contribute to the development of a just and socially cohesive city.

The terrorism variable takes into account the acts of terrorism that have been committed in the previous three years in the city. It is included with a negative sign since such acts undermine the social peace of the city.

This year, three new variables have been incorporated. The female-friendly variable seeks to measure the urban degree of freedom and safety for the development of women and it is expressed in categories from 1 to 5, where the highest score corresponds to cities that are more female-friendly. It is included in the index with a positive sign. The other two variables incorporated are the suicide rate and the homicide rate by city, with a negative sign in the index, due to their impact on the dimension also being negative: the higher the homicide rate, the more insecure the city becomes; the higher the suicide rate, the less attractive it is as a place to live.

Economy

This dimension includes all those aspects that promote the economic development of a territory: local economic development plans, transition plans, and strategic industrial plans; cluster generation; innovation; and entrepreneurial initiatives.

The indicators used to represent the performance of cities in the economic dimension are specified in **Table 3**, along with a brief description, their units of measurement, and the sources of information

Considering that the **CIMI** seeks to measure, via multiple dimensions, the future sustainability of the world's main cities and the quality of life of their inhabitants, real GDP is a measure of the city's economic power and the income of those who live there. Indeed, in numerous studies, GDP is considered the only or the most im-

Table 3. Economic Indicators

No.	Indicator	Description / Unit of measurement	Source
27	Productivity	Labor productivity calculated as GDP per working population (in thousands).	Euromonitor
28	Time required to start a business	Number of calendar days needed so a business can operate legally.	World Bank
29	Ease of starting a business	The top positions in the ranking indicate a more favorable regulatory environment for creating and developing a local company.	World Bank
30	Headquarters	Number of headquarters of publicly traded companies.	Globalization and World Cities (GaWC)
31	Motivation to get started in TEA (total early-stage entrepreneurial activity)	Percentage of people involved in TEA (that is, novice entrepreneurs and owners or managers of a new business), driven by an opportunity for improvement, divided by the percentage of TEA that is, in turn, motivated by need.	Global Entrepreneurship Monitor (GEM)
32	GDP estimate	Estimated annual GDP growth.	Euromonitor
33	GDP	GDP in millions of dollars at 2016 prices.	Euromonitor
34	GDP per capita	GDP per capita at 2016 prices.	Euromonitor
35	Mortgage	Mortgage as a percentage of income. It is calculated as a proportion of the real monthly cost of the mortgage with respect to the family income (estimated via the average monthly salary). The lower the percentage, the better.	Numbeo
36	Glovo	The variable assumes the value of 1 if the city has the Glovo service and 0 otherwise.	Glovo
37	Uber	The variable assumes the value of 1 if the city has the Uber service and 0 otherwise.	Uber
38	Salary	Hourly wage in the city.	Euromonitor
39	Purchasing power	Purchasing power (determined by the average salary) for the purchase of goods and services in the city, compared with the purchasing power in New York City.	Numbeo

portant measure of the performance of a city or country. However, in this report, it is not considered as exclusive nor as the most important measure but as one more indicator within the framework of the nine dimensions of the **CIMI**. Thus, its share of the total is similar to that of other indicators. For example, if a city with a high or relatively high GDP does not have a good performance in other indicators, it may not be in one of the top positions. In this way, a city that is very productive but has problems with transportation, inequality, weak public finance or a production process that uses polluting technology probably will not be in the top positions of the ranking. Additionally, we have included the estimated annual GDP growth to study the future progress of the city.

For its part, labor productivity allows for a measurement of the strength, efficiency and technological level of the production system. With regard to local and international competitiveness, productivity will have repercussions, obviously, on real salaries, capital income, and business profits—for which reason, it is very important to consider the measure in the economic dimension, since different productivity rates can explain differences in workers' quality of life—and the sustainability over time of the production system.

Other indicators selected as representative of this dimension enable the measurement of some aspects of the business landscape of a city, such as the number of headquarters of publicly traded parent companies; the entrepreneurial capacity and possibilities of a city's inhabitants, represented by the percentage of entrepreneurs who start their activity motivated by personal improvement; and the time required to start a business and the ease of setting up a business in regulatory terms. These indicators measure a city's sustainability capacity over time and the potential ability to improve the quality of life of its inhabitants. The time required to start a business and the ease of launching it are incorporated into the economic dimension with a negative sign, since lower values indicate a greater ease of starting businesses. The number of headquarters of publicly traded parent companies, the entrepreneurial capacity and possibilities of a city's inhabitants and the number of entrepreneurs have a positive relationship, since the high values of these indicators reflect the economic dynamism of a city, as well as the ease of setting up and starting a new business.

This year, five new variables have been incorporated in this dimension. In the case of the percentage of the family income represented by mortgage payments, this is added to complement the information collected by the variable of the price of private property. An attempt is made to measure the extent to which access to a 20-year mortgage is within the reach of a middle-income family. The higher the percentage of the family income taken up by the mortgage, the worse the situation will be for the family. For that reason, the variable is incorporated with a negative sign.

Taking into account the degree of dissemination of new technologies and the services that emerge from them, we also incorporated the Glovo and Uber variables as indicators of the new digital economy. Both variables show the coverage of the respective service in the city. They are binary variables and are incorporated with a positive sign. Information concerning the Mytaxi service was also collected but this was discarded, since it currently has a presence in all the cities considered in the ranking.

Finally, the variable for the hourly wage in the city has been incorporated, along with the index that represents the purchasing power relating to goods and services in the city compared with the purchasing power of a New York resident. Both indicators are added with a positive sign, since high values of these represent a better work situation.

Governance

"Governance" is the term commonly used to describe the effectiveness, quality and sound guidance of state intervention. Given that the city resident is the focal point for solving all the challenges facing cities, factors such as the level of the public's participation and the authorities' ability to involve business leaders and local stakeholders should be taken into account, as well as the application of e government plans. Moreover, this dimension encompasses all those actions aimed at improving the administration's efficiency, including the design of new organizational and management models. In this area, great opportunities open up for private initiative, which can bring greater efficiency.

In this work, governance is understood to have a strong correlation with the state of public finances of a city or country. In this sense, public accounts decisively affect the population's quality of life and a city's sustainability, since they determine the level of present and future taxes that the residents and the production system must face, the expected growth of the general level of prices, the possibilities of public investment in basic social infrastructure, and incentives for private investment. In addition, if the state has financing needs, it will compete with the private sector for funds available in the financial system, which will affect investment.

The indicators that represent the governance dimension in this report are listed in **Table 4**, along with descriptions of them, their units of measurement and the sources of information.

The level of reserves is an indicator of the strength of the public finance system in the short and medium term,

Table 4. Governance Indicators

No.	Indicator	Description / Unit of measurement	Source
40	Reserves	Total reserves in millions of current dollars. Estimate at city level according to the population.	World Bank
41	Reserves per capita	Reserves per capita in millions of current dollars.	World Bank
42	Embassies	Number of embassies and consulates per city.	OpenStreetMap
43	ISO 37120 certification	This establishes whether or not the city has ISO 37120 certification. Certified cities are committed to improving their services and quality of life. It is a variable coded from 0 to 6. Cities that have been certified for the longest time have the highest value. The value 0 is for those cities without certification.	World Council on City Data (WCCD)
44	Research centers	Number of research and technology centers per city.	OpenStreetMap
45	Government buildings	Number of government buildings and premises in the city.	OpenStreetMap
46	Strength of legal rights index	The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate access to loans. The values go from 0 (low) to 12 (high), where the highest ratings indicate that the laws are better designed to expand access to credit.	World Bank
47	Corruption perceptions index	Countries with values close to 0 are perceived as very corrupt and those with an index close to 100 as very transparent.	Transparency International
48	Open data platform	This describes whether the city has an open data system.	CTIC Foundation and Open World Bank
49	E-Government Development Index (EGDI)	The EGDI reflects how a country is using information technology to promote access and inclusion for its citizens.	United Nations
50	Democracy ranking	Ranking where the countries in the highest positions are those considered more democratic.	*The Economist* Intelligence Unit
51	Employment in the public administration	Percentage of population employed in public administration and defense; education; health; community, social and personal service activities; and other activities.	Euromonitor

of their ability to cope with changing economic cycles, and of the strength and sustainability of the economic structure in relation to the state. Likewise, the number of embassies and consulates is an indicator of the city's international importance for global standards. This indicator is based on the embassies that foreign countries assign to the city.

Cities that have ISO 37120 certification are committed to improving their services and quality of life, so a variable has been included that considers whether a city has obtained the certification or not. Standards for smart cities are established in this standard, based on 100 indicators. The aim of this to provide a parameter to compare all the cities equally. This variable is incorporated with a positive sign.

For their part, the number of research centers and the number of government buildings show the degree of representativeness of local government among the public for attending to their requests and carrying out administrative tasks, etc. These variables are included with a positive sign in the **CIMI** calculation.

The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate access to loans. The values go from 0 (low) to 12 (high) and the highest ratings indicate that the laws are better designed to expand access to credit. Creating the conditions and ensuring the effective implementation of the rights of the public and companies situated in their territory are functions that pertain to national or local governments and cannot be delegated. The perception of the observance of legal rights influences all aspects of life of a country or city, such as its business climate, investment incentives, and legal certainty, among others. For this reason, the strength of rights index has been included with a positive sign in the creation of this dimension.

The government corruption perceptions index is a way to measure the quality of governance, since a high perception in society of corruption in public bodies is a sign that state intervention is not being efficient from the point of view of the social economy, given that public services—understood in a broad sense—involve higher costs in relation to a situation with no corruption. In addition,

incentives to invest or settle in countries or cities with a high perception of corruption will be lower than in others with low levels, which negatively affects sustainability. In the case of the **CIMI**, it is taken as an explanatory indicator of the governance dimension, with a positive sign, due to how the index is calculated by the organization Transparency International, which assigns a value of 0 to countries with a high level of corruption and 100 to those with a high degree of transparency.

Finally, the variable that considers whether a city's government has an open data platform is an indicator of transparency in government management, a communication channel with the public and a platform for generating new business models. The variable assigns a value of 1 if there is an open data platform and 0 otherwise. Therefore, the indicator is incorporated with a positive sign into this dimension.

The E-Government Development Index (EGDI) reflects how a country is using information technology to promote access and inclusion for its citizens. It is a measure composed of three important dimensions of e government: the provision of online services, telecommunications connectivity and human capacity. This variable is included with a positive sign.

The Democracy Index, for its part, shows a country's degree of democracy, represented by its electoral system, its freedom of expression, the functioning of the government, and political participation and culture. It is included with a negative sign since the countries in the highest positions are those considered more democratic.

This year, a new variable has been incorporated for the percentage of employees in public-sector jobs, such as education, defense and health, and it is included with a positive sign in the dimension, since it is an indicator of the human capital in the public sector.

The Environment

Sustainable development of a city can be defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[1] In this respect, factors such as improving environmental sustainability through antipollution plans, support for green buildings and alternative energy, efficient water and waste management, and the existence of policies that help counter the effects of climate change are essential to guarantee the long-term sustainability of cities.

Since the **CIMI** also seeks to measure environmental sustainability, the environment is included as one of the essential aspects of measurement. **Table 5** sets out the indicators selected in this dimension, as well as brief descriptions, their units of measurement, and the sources of the information.

The indicators selected include measurements of air pollution sources and water quality in cities, which are indicators of the quality of life of their inhabitants, as well as the sustainability of their production or urban matrix.

CO_2 emissions come from the burning of fossil fuels and the manufacture of cement, while methane emissions arise from human activities such as agriculture and the industrial production of methane. Both types of emissions are the main measures that are commonly used to evaluate the degree of air pollution, since they are substances that are strongly related to the greenhouse effect. In fact, reducing these indicators' values is one of the goals of the Kyoto Protocol.

Other very important indicators for measuring air pollution in cities are PM2.5 and PM10, designations that correspond to small particles (solid or liquid) of dust, ash, soot, metal, cement, or pollen, scattered in the atmosphere and whose diameter is less than 2.5 µm and 10 µm, respectively. These particles are formed primarily by inorganic compounds such as silicates and aluminates, heavy metals, and organic material associated with carbon particles (soot). These indicators are commonly used in the indexes that seek to measure the state of environmental pollution. They are also complemented by the information provided by a city's pollution index, which estimates its overall pollution. The greatest weight is given to those cities with the highest air pollution.

The Environmental Performance Index (EPI), calculated by Yale University, is an indicator based on the measurement of two major dimensions related to the environment, namely: environmental health and ecosystem vitality. The first is divided into three subdimensions: effects on human health of air pollution, water quality and the environmental burden of diseases. In turn, ecosystem vitality contains seven subdimensions: effects on

[1] Definition used in 1987 by the UN's World Commission on Environment and Development, created in 1983.

Table 5. Environmental Indicators

No.	Indicator	Description / Unit of measurement	Source
52	CO_2 emissions	CO_2 emissions from the burning of fossil fuels and the manufacture of cement. Measured in kilotons (kt).	World Bank
53	CO_2 emission index	CO_2 emission index.	Numbeo
54	Methane emissions	Methane emissions that arise from human activities such as agriculture and the industrial production of methane. Measured in kt of CO_2 equivalent.	World Bank
55	Access to the water supply	Percentage of the population with reasonable access to an appropriate quantity of water resulting from an improvement in the supply.	World Bank
56	PM2.5	The indicator PM2.5 measures the number of particles in the air whose diameter is less than 2.5 micrometers (µm). Annual mean.	World Health Organization (WHO)
57	PM10	The indicator PM10 measures the amount of particles in the air whose diameter is less than 10 µm. Annual mean.	WHO
58	Pollution	Pollution index.	Numbeo
59	Environmental Performance Index (EPI)	This measures environmental health and ecosystem vitality. Scale from 1 (poor) to 100 (good).	Yale University
60	Renewable water resources	Total renewable water sources per capita.	Food and Agriculture Organization of the United Nations (FAO)
61	Future climate	Percentage of the rise in temperature in the city during the summer forecast for 2100 if pollution caused by carbon emissions continues to increase.	Climate Central
62	Solid waste	Average amount of municipal solid waste (garbage) generated annually per person (kg/year).	Waste Management for Everyone

the ecosystem of air pollution, water quality, biodiversity and habitat, afforestation, fish, agriculture, and climate change. Given the completeness of this indicator—which covers almost all aspects related to measuring the state and evolution of the environment in a city, complemented by the other indicators that the **CIMI** incorporates—the environment dimension is considered to be represented proportionately.

Water is a renewable energy source that is fundamental for dealing with climate change and its devastating effects. The variable of total renewable water sources per capita considers both internal and external renewable surface water resources, and it represents the resources that a country has so it can have a sustainable future. For this reason, it is included with a positive sign in the calculation of the index.

The variable of future climate represents the percentage of the rise in the city's temperature during the summer forecast for 2100 if pollution caused by carbon emissions continues to increase. This variable shows the future risks of today's pollution and is included with a negative sign, since a continuous increase in temperature in a city poses a threat to public health and the economy.

Finally, the average amount of municipal solid waste (garbage) generated annually per person (kg/year) in a city represents potential harm for its inhabitants and the environment due to the prevalence of poor solid waste management. In many cities, this poor management also means an additional health risk for the people who work with this waste. For this reason, the variable is incorporated into the index with a negative sign.

Mobility and Transportation

The cities of the future have to tackle two major challenges in the field of mobility and transportation: facilitating movement (often over large territories) and access to public services.

Mobility and transportation—both with regard to road and route infrastructure, the vehicle fleet, and public transportation, as well as to air transportation—affect the quality of life of a city's inhabitants and can be vital to the sustainability of cities over time. However, perhaps the most important aspect is the externalities that are generated in the production system, whether because of the workforce's need to commute or because of the need for an outlet for production.

Table 6 sets out the indicators selected in the dimension of mobility and transportation, descriptions of them, their units of measurement, and the sources of the information.

Table 6. Mobility and Transportation Indicators

No.	Indicator	Description / Unit of measurement	Source
63	Traffic index	Consideration of the time spent in traffic, the dissatisfaction this generates, CO_2 consumption and other inefficiencies of the traffic system.	Numbeo
64	Inefficiency index	Estimation of traffic inefficiencies (such as long journey times). High values represent high rates of inefficiency in driving.	Numbeo
65	Index of traffic for commuting to work	Index of time that takes into account how many minutes it takes to commute to work.	Numbeo
66	Bike sharing	This system shows the automated services for the public use of shared bicycles that provide transport from one location to another within a city. The indicator varies between 0 and 8 according to how developed the system is.	Bike-Sharing World Map
67	Length of the metro system	Length of the metro system per city.	Metrobits
68	Metro stations	Number of metro stations per city.	Metrobits
69	Flights	Number of arrival flights (air routes) in a city.	OpenFlights
70	High-speed train	Binary variable that shows whether the city has a high-speed train or not.	OpenRailwayMap
71	Vehicles	Number of commercial vehicles in the city (in thousands).	Euromonitor
72	Bicycles per household	Percentage of bicycles per household.	Euromonitor

The indexes for general traffic, traffic caused by commuting to work, and inefficiency are estimates of the traffic inefficiencies caused by long driving times and by the dissatisfaction that these situations generate in the population. These indicators are a measure of the safety of roads and public transportation, which, if it is effective and has a good infrastructure, promotes a decrease in vehicular traffic on public thoroughfares and reduces the number of accidents. All these are included with a negative sign in the calculation of the **CIMI**, since they have a negative impact on the development of a sustainable city.

The bike-sharing indicator, for its part, collects information about a city's public system of shared bicycles aimed at making it possible to move from one location to another using them. It varies between 0 and 8, where 0 refers to the lack of such a system in the city and 8 refers to a highly developed system. It is incorporated with a positive sign in the **CIMI**.

The number of metro stations and the length of the system are indicators of commitment to the development of the city and investment with respect to the population size. The number of air routes (arrivals) and the possession of a high-speed train represent the degree of mobility development of a city. A highly developed city will favor the incorporation of new commercial air routes, as well as the circulation and transit of passengers using different means of transport. These indicators are included with a positive sign in the calculation of the index because of the good influence they have on the dimension.

This year we have also incorporated variables for the number of vehicles and the percentage of bicycles that the city has. The former is integrated with a negative sign, and the latter with a positive sign, due to the negative and positive influence they respectively have on traffic and traffic congestion.

Urban Planning

Urban planning has several subdimensions and is closely related to sustainability. If this is inadequate, it causes a reduction in the public's quality of life in the medium term and can also negatively affect investment incentives, since bad planning or a complete lack of planning hinders and increases the costs of logistics and workers' transportation, among other aspects.

To improve the habitability of any territory, it is necessary to take into account the local master plans and the design of green areas and spaces for public use, as well as opting for smart growth. The new urban planning methods should focus on creating compact, well-connected cities with accessible public services.

Depending on the information available, several aspects related to urban plans, the quality of health infrastructure, and housing policies are incorporated as indicators of this dimension. **Table 7** sets out the indicators included in this dimension, along with descriptions of them, their units of measurement, and the sources of information used.

Table 7. Urban Planning Indicators

No.	Indicator	Description / Unit of measurement	Source
73	Bicycles for rent	Number of bike-rental or bike-sharing points, based on docking stations where they can be picked up or dropped off.	OpenStreetMap
74	Percentage of the urban population with adequate sanitation facilities	Percentage of the urban population that uses at least basic sanitation services—that is, improved sanitation facilities that are not shared with other households.	World Bank
75	Number of people per household	Number of people per household. Occupancy by household is measured compared to the average. This makes it possible to estimate if a city has overoccupied or underoccupied households.	Euromonitor
76	High-rise buildings	Percentage of buildings considered high-rises. A high-rise is a building of at least 12 stories or 35 meters (115 feet) high.	Skyscraper Source Media
77	Buildings	This variable is the number of completed buildings in the city. It includes structures such as high-rises, towers and low-rise buildings but excludes other various others, as well as buildings in different states of completion (in construction, planned, etc.).	Skyscraper Source Media

The bicycle is an effective, fast, economical, healthy, and environmentally friendly means of transportation. Therefore its use has a positive impact on a city's sustainable development as it does not cause pollution or use fuel, among other benefits. Considering this positive effect, the index includes in the **CIMI** the number of points for the rental or sharing of this means of transport, based on docking stations where bicycles can be picked up or dropped off. Many cities historically considered to be smart cities have a certain positive correlation with widespread bicycle use. As a result, this variable is included with a positive sign.

For its part, the quality of health infrastructure refers to the percentage of the urban population with improved sanitation facilities that are not shared with other households. This indicator has a high correlation with that of urban planning, since it can be shown that inadequate planning inevitably results in health problems in the short and medium term.

In addition, from the urban planning and housing point of view, a city with proper urban planning generally has few or no problems of overcrowding in households, since normally housing policy, in relation to the estimated growth in the number of residents, is a determining factor in urban planning. For this reason, within the explanatory indicators of this dimension, the number of occupants of each household is included with a negative sign.

In turn, the number of completed buildings and the percentage of high-rises contribute to the creation of compact and organized cities. These variables are incorporated with a positive sign.

International Outreach

Cities that want to progress must secure a privileged place in the world. Maintaining global impact involves improving the city brand and its international recognition through strategic tourism plans, the attracting of foreign investment and representation abroad.

Cities can have a greater or lesser international outreach even if they are from the same country but this aspect is not independent of the degree of openness nationally. This dimension seeks to reflect these differences and to measure the international outreach of cities.

In this respect, the following indicators have been included: airports, number of passengers by airport, number of hotels in a city, ranking of the most popular places in the world according to Sightsmap, and number of meetings and conferences that are held according to data from the International Congress and Convention Association. This last indicator is important for a city's international reputation, taking into account that these events usually take place in cities with international hotels, meeting rooms specially fitted out for such ends, good frequency of international flights, and appropriate security measures. **Table 8** summarizes these indicators, along with descriptions of them, their units of measurement, and the sources of information.

All indicators of this dimension, except Sightsmap, are incorporated with a positive sign into the calculation of the **CIMI** since the higher the value of the indicators, the greater the impact that the city has on the world. Sightsmap is incorporated with a negative sign, since the top positions in its ranking correspond with the most-photographed cities, of which there is a higher number of references in Wikipedia and Foursquare.

Table 8. International Outreach Indicators

No.	Indicator	Description / Unit of measurement	Source
78	McDonald's	Number of McDonald's chain restaurants per city.	OpenStreetMap
79	Number of passengers per airport	Number of passengers per airport in thousands.	Euromonitor
80	Sightsmap	Ranking of cities according to the number of photos taken there and uploaded to Panoramio (community where photographs were shared online). The top positions correspond to the cities with the most photographs.	Sightsmap
81	Number of conferences and meetings	Number of international conferences and meetings that are held in a city.	International Congress and Convention Association (ICCA)
82	Hotels	Number of hotels per capita.	OpenStreetMap
83	Restaurant index	The index shows the prices of food and beverages in restaurants and bars compared to New York City.	Numbeo

This year, the variable "restaurant index" is included. It seeks to compare the price of the restaurants in the city with respect to those of New York. It is incorporated with a positive sign as an indicator of the international culinary quality.

Technology

Although it is not the only important aspect for cities, information and communications technology (ICT) is part of the backbone of any society that wants to achieve "smart" status.

Technology, an integral dimension of the **CIMI**, is an aspect of society that improves the present quality of life, and its level of development or spread is an indicator of the quality of life achieved or the potential quality of life. In addition, technological development is a dimension that allows cities to be sustainable over time and to maintain or extend the competitive advantages of their production system and the quality of employment. A technologically backward city has comparative disadvantages with respect to other cities, both from the point of view of security, education, and health—all fundamental for the sustainability of society—and from the point of view of the productive apparatus. As a consequence, the production functions become anachronistic. So competitiveness, without protectionism, becomes depleted and has a negative effect on the city's capacity for consumption and investment, as well as reducing labor productivity.

The indicators selected for measuring the cities' performance in terms of the reach of technology and growth in the cities are set out in **Table 9** below, along with descriptions of them, their units of measurement, and the sources of information.

The indicators that represent the number of Twitter and LinkedIn users are grouped into a variable called "social media." This is incorporated with a positive sign in the **CIMI**, since it shows the degree to which a city's inhabitants are connected with technology.

The variables showing the percentage of households with the Internet and with mobile phones, as well as the variables for landline and broadband subscriptions, show the degree of technological development that a city has, as they enable households and businesses to access the means necessary to make efficient use of technology.

The innovation cities index is calculated by carrying out assessments on the basis of various factors relating to urban technological innovation in sectors such as health, the economy in general and the population, among others. It is now the most comprehensive indicator for measuring the degree of development of innovation in cities, and is divided methodologically into three aspects or dimensions: cultural assets, human infrastructure and interconnected markets.

The number of wireless access points globally represents the connection options available to the city's inhabitants when they are outside their home. This variable shows the city's degree of commitment to technological development.

This year, four new variables have been incorporated: percentage of households with some kind of telephone service, percentage of households with personal computers, Internet speed in the city, and Web Index. The four variables attempt to show, along with the previous ones, the degree of technology penetration of the city.

All the indicators of this dimension are related directly to technology, so they are incorporated with a positive sign in this dimension.

Table 9. Technology Indicators

No.	Indicator	Description / Unit of measurement	Source
84	Twitter	Registered Twitter users in the city. This is part of the social media variable.	Tweepsmap
85	LinkedIn	Number of users in the city. This is part of the social media variable.	LinkedIn
86	Mobile phones	Number of mobile phones in the city via estimates based on country-level data.	International Telecommunication Union
87	Wi-Fi hot spot	Number of wireless access points globally. These represent the options in the city for connecting to the Internet.	WiFi Map app
88	Innovation Cities Index	Innovation index of the city. Valuation of 0 (no innovation) to 60 (a lot of innovation).	Innovation Cities Program
89	Landline subscriptions	Number of landline subscriptions per 100 inhabitants.	International Telecommunication Union
90	Broadband subscriptions	Broadband subscriptions per 100 inhabitants.	International Telecommunication Union
91	Internet	Percentage of households with access to the Internet.	Euromonitor
92	Mobile telephony	Percentage of households with mobile phones in the city.	Euromonitor
93	Web Index	The Web Index seeks to measure the economic, social and political benefit that countries obtain from the Internet.	World Wide Web Foundation
94	Telephony	Percentage of households with some kind of telephone service.	Euromonitor
95	Internet speed	Internet speed in the city.	Nomad List
96	Computers	Percentage of households with a personal computer in the city.	Euromonitor

Limitations of the Indicators

Appendix 1 describes, by way of summary, all the indicators used in each dimension, and brief descriptions, units of measurement and the sources of information are included.

Perhaps the most significant limitation in the calculation of the **CIMI** is linked to the availability of data, although efforts were made to minimize the impact of this. First of all, for those indicators that did not have data for the entire period under analysis, extrapolation techniques were used. Secondly, for situations where the indicator values by city were nonexistent but where there were valid values by country, individual values were assigned to each city, connecting the indicator at the country level via some other variable linked theoretically at the city level. Lastly, in those cases where no data were available for a particular city or group of cities for the whole period under consideration, statistical cluster techniques were used. The scope and detail of these tools are discussed thoroughly in the supplementary document *IESE Cities in Motion Index 2014: Methodology and Modeling*.

With the **CIMI** platform, we continue to work to obtain more complete and accurate indicators, while we urge cities to allow access to their information, since analyzing it will make it easier to improve those aspects that can be optimized.

Geographic Coverage

For the production of this year's **CIMI**, 174 cities have been studied, 79 of which are capitals, with the geographical distribution depicted in **Figure 1**.

Figure 1. Geographical Distribution of the Cities Included in the Index

North America

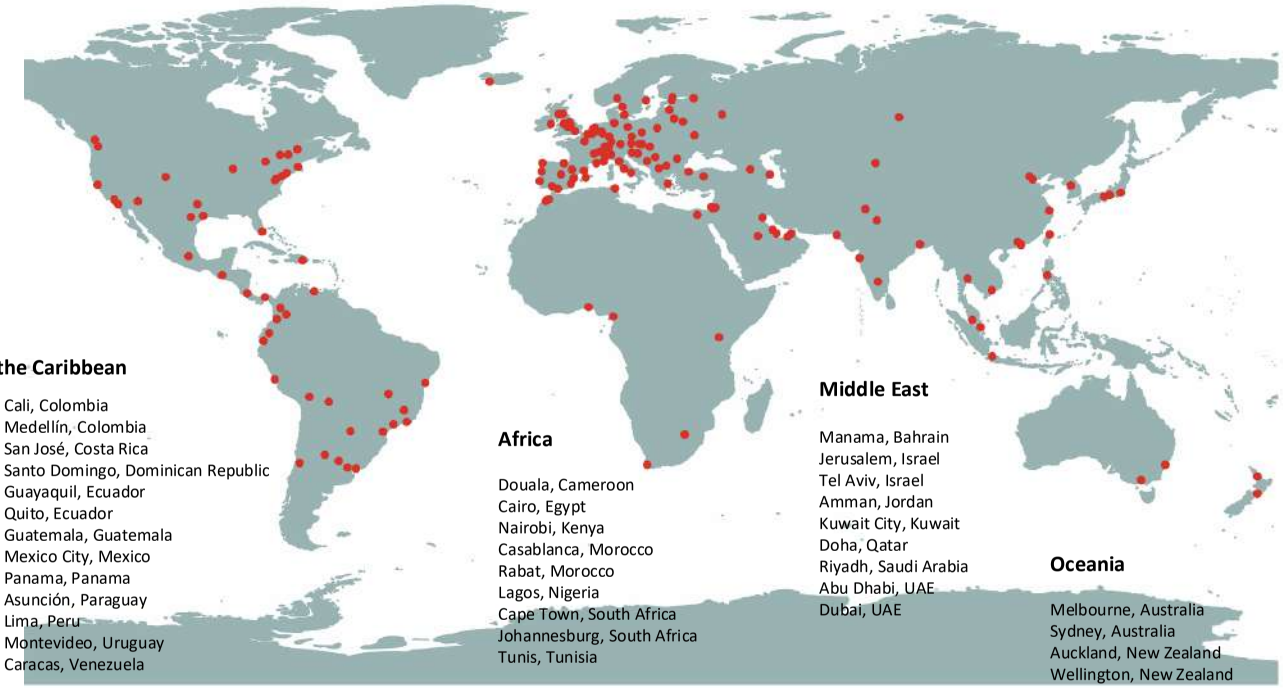
Montreal, Canada
Ottawa, Canada
Quebec, Canada
Toronto, Canada
Vancouver, Canada
Baltimore, USA
Boston, USA
Chicago, USA
Dallas, USA
Denver, USA
Houston, USA
Los Angeles, USA
Miami, USA
New York, USA
Philadelphia, USA
Phoenix, USA
San Antonio, USA
San Diego, USA
San Francisco, USA
Seattle, USA
Washington, USA

Western Europe

Linz, Austria
Vienna, Austria
Antwerp, Belgium
Brussels, Belgium
Copenhagen, Denmark
Helsinki, Finland
Lille, France
Lyon, France
Marseille, France
Nice, France
Paris, France
Berlin, Germany
Cologne, Germany
Duisburg, Germany
Düsseldorf, Germany
Frankfurt, Germany
Hamburg, Germany
Munich, Germany
Stuttgart, Germany
Athens, Greece
Reykjavík, Iceland
Dublin, Ireland
Florence, Italy
Milan, Italy
Naples, Italy
Rome, Italy
Turin, Italy
Amsterdam, Netherlands
Eindhoven, Netherlands
Rotterdam, Netherlands
Oslo, Norway
Lisbon, Portugal
Porto, Portugal
A Coruña, Spain
Barcelona, Spain
Bilbao, Spain
Madrid, Spain
Málaga, Spain
Murcia, Spain
Palma de Mallorca, Spain
Seville, Spain
Valencia, Spain
Valladolid, Spain
Zaragoza, Spain
Göteborg, Sweden
Stockholm, Sweden
Basel, Switzerland
Bern, Switzerland
Geneva, Switzerland
Zurich, Switzerland
Birmingham, United Kingdom
Edinburgh, United Kingdom
Glasgow, United Kingdom
Leeds, United Kingdom
Liverpool, United Kingdom
London, United Kingdom
Manchester, United Kingdom
Nottingham, United Kingdom

Eastern Europe and Russia

Baku, Azerbaijan
Minsk, Belarus
Sarajevo, Bosnia and Herzegovina
Sofia, Bulgaria
Zagreb, Croatia
Prague, Czech Republic
Tallinn, Estonia
Tbilisi, Georgia
Budapest, Hungary
Riga, Latvia
Vilnius, Lithuania
Skopje, North Macedonia
Wrocław, Poland
Warsaw, Poland
Bucharest, Romania
Moscow, Russia
Novosibirsk, Russia
Saint Petersburg, Russia
Belgrade, Serbia
Bratislava, Slovakia
Ljubljana, Slovenia
Ankara, Turkey
Istanbul, Turkey
Kiev, Ukraine



Asia

Beijing, China
Guangzhou, China
Hong Kong, China
Shanghai, China
Shenzhen, China
Tianjin, China
Bangalore, India
Kolkata, India
Mumbai, India
New Delhi, India
Jakarta, Indonesia
Nagoya, Japan
Osaka, Japan
Tokyo, Japan
Almaty, Kazakhstan
Kuala Lumpur, Malaysia
Karachi, Pakistan
Lahore, Pakistan
Manila, Philippines
Singapore, Singapore
Seoul, South Korea
Bangkok, Thailand
Taipei, Taiwan
Ho Chi Minh City, Vietnam

Latin America and the Caribbean

Buenos Aires, Argentina
Córdoba, Argentina
Rosario, Argentina
La Paz, Bolivia
Santa Cruz, Bolivia
Belo Horizonte, Brazil
Brasília, Brazil
Curitiba, Brazil
Rio de Janeiro, Brazil
Salvador, Brazil
São Paulo, Brazil
Santiago, Chile
Bogotá, Colombia
Cali, Colombia
Medellín, Colombia
San José, Costa Rica
Santo Domingo, Dominican Republic
Guayaquil, Ecuador
Quito, Ecuador
Guatemala, Guatemala
Mexico City, Mexico
Panama, Panama
Asunción, Paraguay
Lima, Peru
Montevideo, Uruguay
Caracas, Venezuela

Africa

Douala, Cameroon
Cairo, Egypt
Nairobi, Kenya
Casablanca, Morocco
Rabat, Morocco
Lagos, Nigeria
Cape Town, South Africa
Johannesburg, South Africa
Tunis, Tunisia

Middle East

Manama, Bahrain
Jerusalem, Israel
Tel Aviv, Israel
Amman, Jordan
Kuwait City, Kuwait
Doha, Qatar
Riyadh, Saudi Arabia
Abu Dhabi, UAE
Dubai, UAE

Oceania

Melbourne, Australia
Sydney, Australia
Auckland, New Zealand
Wellington, New Zealand

Cities in Motion. Ranking

The **CIMI**, which is the subject of this report, is a synthetic indicator and, as such, is a function based on the partial indicators available.

The process of creating this synthetic indicator is based on a model of weighted aggregation of partial indicators that represent each of the nine dimensions that make up the **CIMI** theoretical model. The dimensions selected to describe the situation of cities in terms of sustainability and the quality of life of their inhabitants, both in the present and in the future, are as follows: human capital, social cohesion, the economy, governance, the environment, mobility and transportation, urban planning, international outreach, and technology.

The partial indicators representative of each dimension also correspond to the category of synthetic indicators, which are defined as "weighted aggregations of each of the selected indicators that represent different factors of each dimension."

Given the type of indicator in question and the data available, for the calculation of the **CIMI**, the DP2 technique has been used, this being the most widely used internationally and the most suitable. Its methodology is based on distance—that is, the difference between an indicator's given value and another value taken as a reference or target. Likewise, this technique attempts to correct the dependence among the partial indicators, which would artificially increase the indicator's sensitivity to variations in certain partial values. The correction consists of applying the same factor to each partial indicator, assuming a linearly dependent function is established between them.[2]

Given the partial indicators, the factors are given by the complement of the coefficient of determination (R^2) for each indicator compared with the rest of the partial indicators. The order in which the indicators of each dimension have been included, as well as their relative weight in the **CIMI**, is as follows: the economy (1), human capital (0.612), international outreach (0.511), urban planning (0.487), the environment (0.831), technology (0.356), governance (0.404), social cohesion (0.567) and mobility and transportation (0.548).

While the order in which the synthetic indexes of each dimension are incorporated influences the value of the **CIMI**, the sensitivity studies carried out concluded that there are no significant variations in it. More details on the methodology can be seen in the supplementary document *IESE Cities in Motion Index 2014: Methodology and Modeling, mentioned previously*.

Table 10 sets out the **CIMI** city ranking, together with the index value. The cities are grouped according to their performance, measured by the value of the synthetic indicator. The performance of the cities is rated as follows: high (H) if they have an index greater than 90; relatively high (RH) if the city is between 60 and 90; medium (M) if it is in the range between 45 and 60; low (L) if it is between 45 and 15; and very low (VL) if it is below 15.

[2] Because linear estimates are involved, variables with a normal distribution are required, so a log transformation has been applied to some variables to obtain the said normality. Likewise, outlier techniques have been applied to avoid bias and overestimations of coefficients.

Table 10. City Ranking

Ranking	City	Performance	CIMI
1	London - United Kingdom	H	100,00
2	New York - USA	H	94,63
3	Amsterdam - Netherlands	RH	86,70
4	Paris - France	RH	86,23
5	Reykjavík - Iceland	RH	85,35
6	Tokyo - Japan	RH	84,11
7	Singapore - Singapore	RH	82,73
8	Copenhagen - Denmark	RH	81,80
9	Berlin - Germany	RH	80,88
10	Vienna - Austria	RH	78,85
11	Hong Kong - China	RH	78,76
12	Seoul - South Korea	RH	78,13
13	Stockholm - Sweden	RH	77,89
14	Oslo - Norway	RH	77,45
15	Zurich - Switzerland	RH	76,66
16	Los Angeles - USA	RH	76,04
17	Chicago - USA	RH	75,55
18	Toronto - Canada	RH	75,30
19	Sydney - Australia	RH	75,26
20	Melbourne - Australia	RH	75,08
21	San Francisco - USA	RH	75,07
22	Helsinki - Finland	RH	74,08
23	Washington - USA	RH	73,14
24	Madrid - Spain	RH	73,02
25	Boston - USA	RH	72,91
26	Wellington - New Zealand	RH	72,82
27	Munich - Germany	RH	72,71
28	Barcelona - Spain	RH	72,25
29	Basel - Switzerland	RH	70,39
30	Taipei - Taiwan	RH	70,04
31	Bern - Switzerland	RH	70,03
32	Geneva - Switzerland	RH	69,78
33	Frankfurt - Germany	RH	69,39
34	Hamburg - Germany	RH	69,23
35	Auckland - New Zealand	RH	69,10
36	Göteborg - Sweden	RH	68,65
37	Dublin - Ireland	RH	68,19
38	Montreal - Canada	RH	66,82
39	Ottawa - Canada	RH	66,68
40	Miami - USA	RH	66,31
41	Milan - Italy	RH	65,94
42	Phoenix - USA	RH	65,73
43	Rotterdam - Netherlands	RH	65,38
44	Lisbon - Portugal	RH	65,32
45	Dallas - USA	RH	65,13
46	Edinburgh - United Kingdom	RH	65,06
47	Prague - Czech Republic	RH	64,97
48	Brussels - Belgium	RH	64,79
49	San Diego - USA	RH	64,43
50	Düsseldorf - Germany	RH	64,34
51	Cologne - Germany	RH	64,19
52	Denver - USA	RH	64,01
53	Stuttgart - Germany	RH	64,01
54	Philadelphia - USA	RH	63,27
55	Vancouver - Canada	RH	63,15
56	Lyon - France	RH	62,56
57	Eindhoven - Netherlands	RH	62,35
58	Seattle - USA	RH	61,96
59	Shanghai - China	RH	61,78
60	Houston - USA	RH	61,74
61	Valencia - Spain	RH	61,52
62	San Antonio - USA	RH	61,33
63	Birmingham - United Kingdom	RH	61,30
64	Glasgow - United Kingdom	RH	61,23
65	Tallinn - Estonia	RH	60,96
66	Santiago - Chile	RH	60,96
67	Quebec - Canada	RH	60,64
68	Osaka - Japan	RH	60,50
69	Warsaw - Poland	RH	60,13
70	Bratislava - Slovakia	M	59,92
71	Baltimore - USA	M	59,86
72	Antwerp - Belgium	M	59,84
73	Budapest - Hungary	M	59,65
74	Vilnius - Lithuania	M	59,15
75	Rome - Italy	M	59,09
76	Seville - Spain	M	58,57
77	Buenos Aires - Argentina	M	58,42
78	Manchester - United Kingdom	M	58,05
79	Leeds - United Kingdom	M	57,98
80	Málaga - Spain	M	57,59
81	Tel Aviv - Israel	M	57,47
82	Nagoya - Japan	M	57,26
83	Beijing - China	M	56,81
84	Riga - Latvia	M	56,27
85	Nice - France	M	56,09
86	Moscow - Russia	M	55,91
87	Linz - Austria	M	55,89
88	Palma de Mallorca - Spain	M	55,57
89	Marseille - France	M	55,10
90	Duisburg - Germany	M	54,93
91	Porto - Portugal	M	54,76
92	Montevideo - Uruguay	M	54,75
93	Ljubljana - Slovenia	M	54,41
94	Liverpool - United Kingdom	M	53,52
95	Wroclaw - Poland	M	53,39
96	Nottingham - United Kingdom	M	53,36
97	Zagreb - Croatia	M	53,30
98	Lille - France	M	52,93
99	Dubai - United Arab Emirates	M	52,92
100	Kuala Lumpur - Malaysia	M	52,83
101	Zaragoza - Spain	M	52,53
102	A Coruña - Spain	M	51,85
103	Bucharest - Romania	M	51,49
104	Bangkok - Thailand	M	51,35
105	Murcia - Spain	M	51,19
106	Athens - Greece	M	50,71
107	Bilbao - Spain	M	50,14
108	Florence - Italy	M	49,54
109	Turin - Italy	M	49,51
110	Minsk - Belarus	M	49,23
111	Kiev - Ukraine	M	49,11
112	San José - Costa Rica	M	49,01
113	Guangzhou - China	M	48,40
114	Panama - Panama	M	47,51
115	Sofia - Bulgaria	M	46,71
116	Naples - Italy	M	46,62
117	Bogotá - Colombia	M	46,01
118	Istanbul - Turkey	M	45,85
119	Shenzhen - China	M	45,28
120	Belgrade - Serbia	L	44,86
121	Saint Petersburg - Russia	L	44,12
122	Ho Chi Minh City - Vietnam	L	43,49

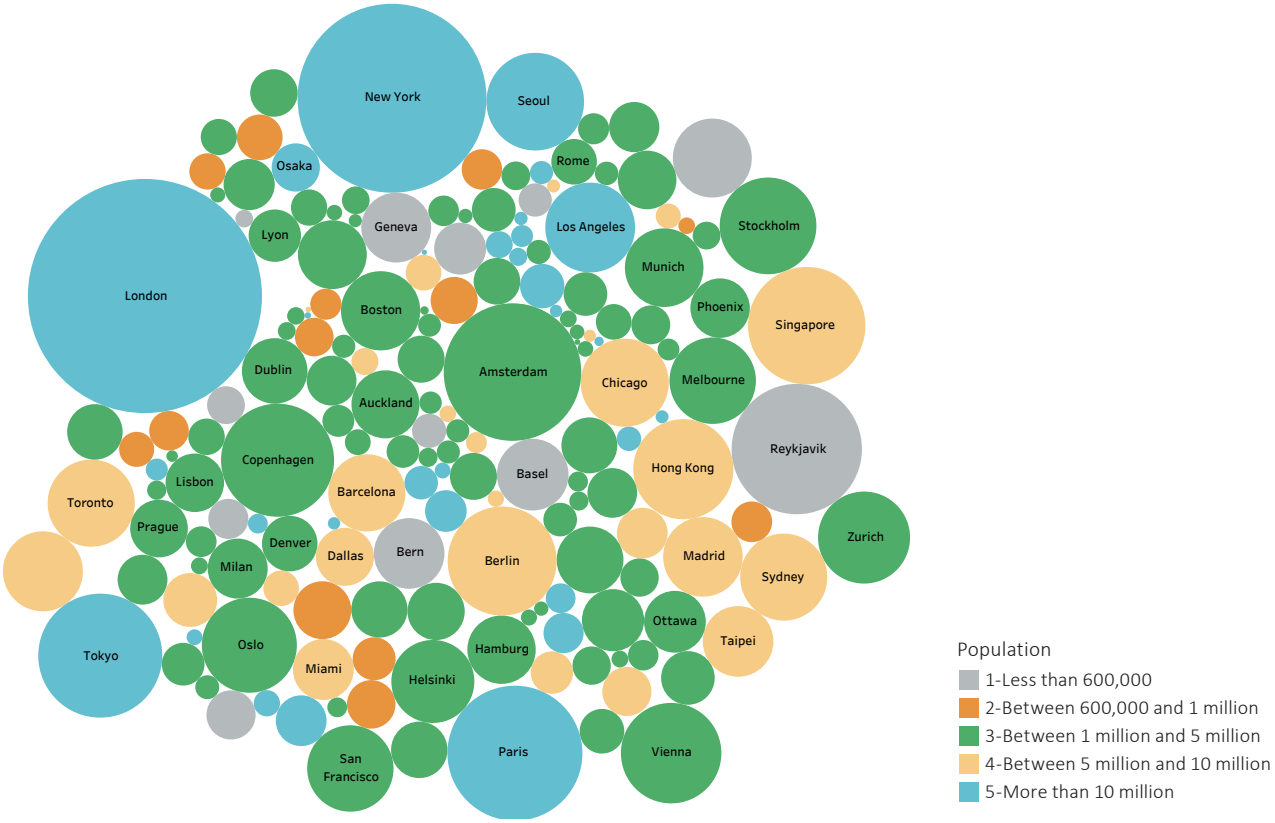
Table 10. City Ranking (continued)

Ranking	City	Performance	CIMI
123	Jerusalem - Israel	L	43,27
124	Tbilisi - Georgia	L	42,96
125	Rosario - Argentina	L	42,45
126	Doha - Qatar	L	42,14
127	Abu Dhabi - United Arab Emirates	L	42,12
128	Rio de Janeiro - Brazil	L	42,08
129	Almaty - Kazakhstan	L	42,04
130	Brasília - Brazil	L	41,84
131	Baku - Azerbaijan	L	41,24
132	São Paulo - Brazil	L	40,90
133	Mexico City - Mexico	L	40,79
134	Medellín - Colombia	L	40,67
135	Ankara - Turkey	L	39,61
136	Córdoba - Argentina	L	38,38
137	Quito - Ecuador	L	38,19
138	Lima - Perú	L	38,14
139	Santo Domingo - Dominican Republic	L	37,43
140	Curitiba - Brazil	L	37,33
141	Asunción - Paraguay	L	37,25
142	Jakarta - Indonesia	L	35,96
143	Kuwait City - Kuwait	L	35,61
144	Sarajevo - Bosnia-Herzegovina	L	35,39
145	La Paz - Bolivia	L	35,12
146	Salvador - Brazil	L	34,20
147	Santa Cruz - Bolivia	L	34,16
148	Cali - Colombia	L	34,04
149	Skopje - North Macedonia	L	33,88
150	Amman - Jordan	L	33,61
151	Belo Horizonte - Brazil	L	33,40
152	Guayaquil - Ecuador	L	33,10
153	Bangalore - India	L	32,65
154	Tianjin - China	L	32,62
155	Casablanca - Morocco	L	32,31
156	Novosibirsk - Russia	L	32,05
157	Tunis - Tunisia	L	31,36
158	Cape Town - South Africa	L	30,68
159	Manama - Bahrain	L	30,06
160	Guatemala City - Guatemala	L	30,06
161	Mumbai - India	L	28,36
162	Nairobi - Kenya	L	27,99
163	Manila - Philippines	L	27,73
164	Riyadh - Saudi Arabia	L	27,71
165	Cairo - Egypt	L	26,74
166	New Delhi - India	L	26,52
167	Johannesburg - South Africa	L	25,95
168	Rabat - Morocco	L	24,78
169	Kolkata - India	L	19,54
170	Douala - Cameroon	L	17,03
171	Lagos - Nigeria	VL	10,24
172	Caracas - Venezuela	VL	6,71
173	Lahore - Pakistan	VL	6,27
174	Karachi - Pakistan	VL	4,57

In the 2018 ranking, headed by London, New York and Amsterdam, it can be observed that 39.66% of the cities (69) have a performance rated high (H) or relatively high (RH). There are 50 cities (28.74%) with an average (M) performance, while those classified as low (L) comprise 29.31%. It should be added that, this year, four of the cities (2.29%) have obtained a rating of very low (VL).

Figure 2 depicts the ranking of the cities according to population. The size of the bubbles reflects the position of the city in the general ranking, and the color reflects the population group to which it belongs, according to the categorization used in the **CIMI**.

Figure 2. Ranking by Population



Cities in Motion: Ranking by Dimension

This section sets out the ranking according to each of the dimensions that make up the index, together with the city's position overall and in each dimension. To make the visual layout more intuitive, the darker greens correspond to the top positions in the **CIMI** ranking, and the darker reds to the worst-ranked cities, while yellow shades reflect the intermediate positions.

Year after year, the top place in the ranking seems to be disputed by London (United Kingdom) and New York (United States), two highly developed and smart cities. This year it has been London's turn to occupy the top position in the overall ranking, thanks to its performance in the dimensions of international outreach (position 1), human capital (position 1), mobility and transportation (position 3) and the economy (position 12). However, the city does not show such a good performance in the dimensions of social cohesion (position 45) and the environment (position 34). It should be made clear that, although the city is not in a prominent position in these dimensions, each year it shows an improvement, consistent with the work being done to turn it into a smart city in every way.

New York is in second place in the overall ranking, thanks to its performance in the dimensions of the economy (position 1), human capital (position 3), urban planning (position 2) and mobility and transportation (position 5). As in previous years, it shows a worse performance in social cohesion (position 137) and the environment (position 78) and, although it has made some improvement in the latter with respect to the previous year, it has not achieved an outstanding position.

The city of Amsterdam (Netherlands) ranks third, having improved a lot in international outreach (position 2) and also standing out in the economy, urban planning, and mobility and transportation.

Table 11 shows the rankings, both overall and by dimension, for the 174 cities included in the index. The interpretation of the table is very important for the analysis of the results, since it allows the relative position of all the cities in each dimension to be known. In **Figure 3**, the positions of the cities on the world map can also be seen.

Table 11. Ranking by Dimension

City	Economy	Human capital	Social cohesion	Environment	Governance	Urban planning	International outreach	Technology	Mobility and transportation	Cities in Motion
London - United Kingdom	12	1	45	34	7	9	1	8	3	1
New York - USA	1	3	137	78	26	2	8	11	5	2
Amsterdam - Netherlands	10	36	38	28	27	11	2	7	11	3
Paris - France	8	6	86	54	37	50	3	15	4	4
Reykjavík - Iceland	90	53	18	1	19	108	22	4	46	5
Tokyo - Japan	3	9	49	6	71	24	35	20	29	6
Singapore - Singapore	21	44	47	10	20	31	4	1	67	7
Copenhagen - Denmark	25	28	11	3	12	75	16	10	25	8
Berlin - Germany	50	5	39	47	6	40	5	32	6	9
Vienna - Austria	57	23	31	15	25	45	7	13	7	10
Hong Kong - China	29	17	140	20	21	8	15	2	40	11
Seoul - South Korea	15	14	95	32	39	27	34	6	17	12
Stockholm - Sweden	18	58	60	5	24	48	24	14	21	13
Oslo - Norway	17	71	20	8	52	54	19	17	20	14
Zurich - Switzerland	22	35	1	25	9	68	21	25	55	15
Los Angeles - USA	2	2	82	152	5	14	33	21	134	16
Chicago - USA	7	10	104	130	41	5	18	35	38	17
Toronto - Canada	40	30	76	53	17	1	27	16	58	18
Sydney - Australia	28	29	22	18	22	23	10	26	109	19
Melbourne - Australia	34	33	23	31	4	15	6	40	111	20
San Francisco - USA	4	11	79	122	64	13	36	3	100	21
Helsinki - Finland	32	55	10	12	8	64	39	66	47	22
Washington - USA	5	8	71	141	13	10	40	31	92	23
Madrid - Spain	39	41	55	58	46	33	17	34	9	24
Boston - USA	9	4	84	115	15	21	69	19	131	25
Wellington - New Zealand	31	68	6	2	14	41	79	79	70	26
Munich - Germany	36	63	16	69	32	58	28	38	8	27
Barcelona - Spain	51	46	89	51	29	29	11	24	12	28
Basel - Switzerland	35	54	4	36	11	136	49	57	19	29
Taipei - Taiwan	83	20	3	145	3	12	55	23	10	30

Table 11. Ranking by Dimension (continued)

City	Economy	Human capital	Social cohesion	Environment	Governance	Urban planning	International outreach	Technology	Mobility and transportation	Cities in Motion
Bern - Switzerland	75	67	2	70	1	104	112	71	22	31
Geneva - Switzerland	37	85	30	60	2	139	13	48	41	32
Frankfurt - Germany	41	45	44	80	59	25	32	73	18	33
Hamburg - Germany	45	32	74	57	28	55	46	59	14	34
Auckland - New Zealand	30	95	25	7	38	53	51	37	106	35
Göteborg - Sweden	33	75	68	11	36	82	83	55	33	36
Dublin - Ireland	26	105	42	24	67	92	30	28	69	37
Montreal - Canada	53	50	43	63	40	7	41	43	84	38
Ottawa - Canada	55	43	13	62	16	6	98	75	79	39
Miami - USA	20	18	102	142	47	36	9	62	94	40
Milan - Italy	42	34	81	66	109	56	31	96	23	41
Phoenix - USA	19	13	72	137	56	59	43	56	66	42
Rotterdam - Netherlands	69	62	35	49	101	16	92	47	16	43
Lisbon - Portugal	71	77	70	14	73	76	26	49	76	44
Dallas - USA	6	12	80	134	63	71	85	29	120	45
Edinburgh - United Kingdom	61	24	12	81	75	109	38	54	39	46
Prague - Czech Republic	96	57	29	26	82	81	20	46	57	47
Brussels - Belgium	65	112	66	43	44	49	45	33	24	48
San Diego - USA	23	21	62	138	10	61	52	45	122	49
Düsseldorf - Germany	47	88	24	33	89	126	47	88	26	50
Cologne - Germany	43	61	26	92	31	130	63	70	27	51
Denver - USA	16	31	78	158	45	18	44	12	96	52
Stuttgart - Germany	38	70	15	65	79	96	89	69	30	53
Philadelphia - USA	14	16	96	144	51	43	88	22	110	54
Vancouver - Canada	104	83	33	77	68	3	58	44	71	55
Lyon - France	62	52	41	64	66	72	75	64	51	56
Eindhoven - Netherlands	56	82	9	107	58	69	99	9	48	57
Seattle - USA	11	51	77	143	23	78	67	30	149	58
Shanghai - China	80	27	129	147	74	37	59	116	1	59

City	Economy	Human capital	Social cohesion	Environment	Governance	Urban planning	International outreach	Technology	Mobility and transportation	Cities in Motion
Houston - USA	13	40	119	150	60	17	56	39	129	60
Valencia - Spain	70	109	46	39	33	51	107	111	31	61
San Antonio - USA	27	37	63	135	57	44	103	51	99	62
Birmingham - United Kingdom	59	38	34	72	55	70	80	85	75	63
Glasgow - United Kingdom	68	25	17	95	49	80	60	84	95	64
Tallinn - Estonia	79	47	37	21	125	62	95	53	90	65
Santiago - Chile	63	93	111	30	87	28	57	100	56	66
Quebec - Canada	54	84	7	79	18	97	114	52	93	67
Osaka - Japan	44	72	85	23	104	91	113	80	60	68
Warsaw - Poland	78	79	69	96	77	20	53	124	45	69
Bratislava - Slovakia	91	49	14	35	50	67	122	113	85	70
Baltimore - USA	24	56	103	129	42	47	91	60	115	71
Antwerp - Belgium	86	108	40	48	96	42	129	63	32	72
Budapest - Hungary	105	42	108	38	85	83	37	67	61	73
Vilnius - Lithuania	94	22	128	22	53	57	108	109	78	74
Rome - Italy	48	48	120	123	62	141	14	106	62	75
Seville - Spain	76	96	50	67	86	60	97	107	37	76
Buenos Aires - Argentina	132	66	113	29	30	19	29	110	133	77
Manchester - United Kingdom	115	19	53	101	76	101	74	77	52	78
Leeds - United Kingdom	77	26	27	84	72	119	128	99	74	79
Málaga - Spain	74	101	54	86	100	107	62	117	34	80
Tel Aviv - Israel	60	126	57	41	54	34	104	42	126	81
Nagoya - Japan	66	91	52	16	98	132	131	103	89	82
Beijing - China	58	64	127	163	116	63	50	115	2	83
Riga - Latvia	146	74	101	27	97	26	93	61	73	84
Nice - France	87	73	73	83	93	116	42	82	105	85
Moscow - Russia	100	7	163	136	43	22	73	92	65	86
Linz - Austria	117	80	5	37	90	143	153	112	35	87
Palma de Mallorca - Spain	120	115	64	88	110	98	12	94	64	88
Marseille - France	84	94	83	106	80	77	87	86	68	89

Table 11. Ranking by Dimension (continued)

City	Economy	Human capital	Social cohesion	Environment	Governance	Urban planning	International outreach	Technology	Mobility and transportation	Cities in Motion
Duisburg - Germany	126	92	21	105	102	135	66	108	28	90
Porto - Portugal	85	125	56	19	92	138	86	89	103	91
Montevideo - Uruguay	106	131	106	4	69	84	110	65	118	92
Ljubljana - Slovenia	136	100	32	45	91	93	134	36	72	93
Liverpool - United Kingdom	110	65	19	109	78	103	127	93	101	94
Wroclaw - Poland	92	89	92	98	112	46	135	128	49	95
Nottingham - United Kingdom	81	69	28	117	81	124	147	90	104	96
Zagreb - Croatia	135	110	61	46	35	86	130	78	98	97
Lille - France	88	97	59	99	117	111	137	95	53	98
Dubai - United Arab Emirates	64	145	36	159	70	90	25	5	117	99
Kuala Lumpur - Malaysia	49	116	109	113	126	94	64	130	59	100
Zaragoza - Spain	122	81	75	93	83	102	149	98	42	101
A Coruña - Spain	128	98	67	59	135	73	150	101	44	102
Bucharest - Romania	72	102	97	104	122	88	78	81	127	103
Bangkok - Thailand	46	133	123	125	150	30	23	127	140	104
Murcia - Spain	125	111	48	97	108	65	163	74	50	105
Athens - Greece	114	78	155	52	143	133	61	27	80	106
Bilbao - Spain	118	117	88	91	107	89	125	87	63	107
Florence - Italy	121	59	90	128	127	147	68	121	54	108
Turin - Italy	111	87	98	133	105	131	101	131	36	109
Minsk - Belarus	113	90	105	61	132	113	146	118	77	110
Kiev - Ukraine	107	103	158	120	114	4	123	119	108	111
San José - Costa Rica	97	158	112	13	61	146	100	105	138	112
Guangzhou - China	82	128	117	154	145	105	90	132	13	113
Panama - Panama	119	146	110	42	147	99	81	50	125	114
Sofia - Bulgaria	164	76	87	90	88	149	115	97	82	115
Naples - Italy	127	99	99	112	141	115	111	136	81	116
Bogotá - Colombia	124	106	159	89	34	112	76	125	148	117
Istanbul - Turkey	67	124	165	132	151	66	48	76	112	118
Shenzhen - China	73	137	136	153	158	100	126	133	15	119

City	Economy	Human capital	Social cohesion	Environment	Governance	Urban planning	International outreach	Technology	Mobility and transportation	Cities in Motion
Belgrade - Serbia	161	107	132	56	128	121	96	68	121	120
Saint Petersburg - Russia	145	39	153	155	99	52	77	120	135	121
Ho Chi Minh City - Vietnam	98	154	124	73	156	114	94	153	83	122
Jerusalem - Israel	150	136	150	55	48	148	65	134	139	123
Tbilisi - Georgia	102	139	122	100	129	140	132	72	141	124
Rosario - Argentina	171	118	51	87	103	32	138	144	142	125
Doha - Qatar	52	168	58	166	149	129	84	18	128	126
Abu Dhabi - United Arab Emirates	116	157	8	169	84	118	54	83	97	127
Rio de Janeiro - Brazil	149	114	168	110	95	38	72	129	154	128
Almaty - Kazakhstan	123	127	138	108	153	74	167	140	87	129
Brasília - Brazil	144	151	151	85	106	106	118	139	88	130
Baku - Azerbaijan	137	123	100	75	164	137	143	122	119	131
São Paulo - Brazil	138	129	167	102	123	39	70	123	168	132
Mexico City - Mexico	131	60	141	168	111	35	71	135	116	133
Medellín - Colombia	140	132	143	114	113	87	155	143	107	134
Ankara - Turkey	162	113	115	139	131	95	142	138	86	135
Córdoba - Argentina	170	120	93	74	119	123	148	151	146	136
Quito - Ecuador	139	130	130	82	169	122	116	157	143	137
Lima - Peru	101	122	139	140	115	142	136	147	152	138
Santo Domingo - Dominican Republic	134	166	149	44	137	120	133	159	158	139
Curitiba - Brazil	153	149	145	71	138	128	152	145	124	140
Asunción - Paraguay	168	119	94	9	160	159	162	165	137	141
Jakarta - Indonesia	160	15	152	127	139	151	102	142	174	142
Kuwait City - Kuwait	163	161	91	146	124	161	117	41	123	143
Sarajevo - Bosnia-Herzegovina	173	86	160	124	133	85	158	146	102	144
La Paz - Bolivia	152	155	131	68	142	144	120	169	156	145
Salvador - Brazil	157	135	162	103	148	110	139	161	144	146
Santa Cruz - Bolivia	148	147	135	17	167	167	140	168	157	147
Cali - Colombia	143	140	114	118	146	155	170	155	151	148
Skopje - North Macedonia	169	150	142	119	121	162	154	102	113	149

Table 11. Ranking by Dimension (continued)

City	Economy	Human capital	Social cohesion	Environment	Governance	Urban planning	International outreach	Technology	Mobility and transportation	Cities in Motion
Amman - Jordan	154	173	126	121	118	153	141	114	169	150
Belo Horizonte - Brazil	156	141	154	116	154	127	160	148	159	151
Guayaquil - Ecuador	142	153	107	111	173	152	156	162	150	152
Bangalore - India	93	134	116	165	140	156	106	154	166	153
Tianjin - China	89	138	125	172	161	134	161	137	43	154
Casablanca - Morocco	99	165	134	156	170	154	151	58	160	155
Novosibirsk - Russia	147	121	147	157	120	117	165	149	163	156
Tunis - Tunisia	166	152	118	76	136	158	168	163	145	157
Cape Town - South Africa	165	142	169	131	94	145	109	152	161	158
Manama - Bahrain	129	156	65	167	166	172	119	91	91	159
Guatemala City - Guatemala	141	164	144	126	134	163	144	166	165	160
Mumbai - India	103	162	148	164	155	157	121	150	164	161
Nairobi - Kenya	130	170	166	40	152	169	145	171	173	162
Manila - Philippines	133	148	161	149	162	160	105	158	170	163
Riyadh - Saudi Arabia	108	169	121	173	65	165	157	104	136	164
Cairo - Egypt	109	144	170	160	172	125	159	141	167	165
New Delhi - India	95	159	157	170	144	168	82	160	114	166
Johannesburg - South Africa	158	143	171	151	130	150	164	156	155	167
Rabat - Morocco	167	174	133	148	163	166	169	126	132	168
Kolkata - India	155	160	156	161	157	164	171	170	172	169
Douala - Cameroon	172	163	146	50	171	173	172	174	162	170
Lagos - Nigeria	159	167	164	162	165	170	173	173	171	171
Caracas - Venezuela	174	104	174	94	159	79	124	164	130	172
Lahore - Pakistan	151	172	173	171	168	174	166	172	147	173
Karachi - Pakistan	112	171	172	174	174	171	174	167	153	174

Figure 3. Map of Cities in the CIMI Ranking

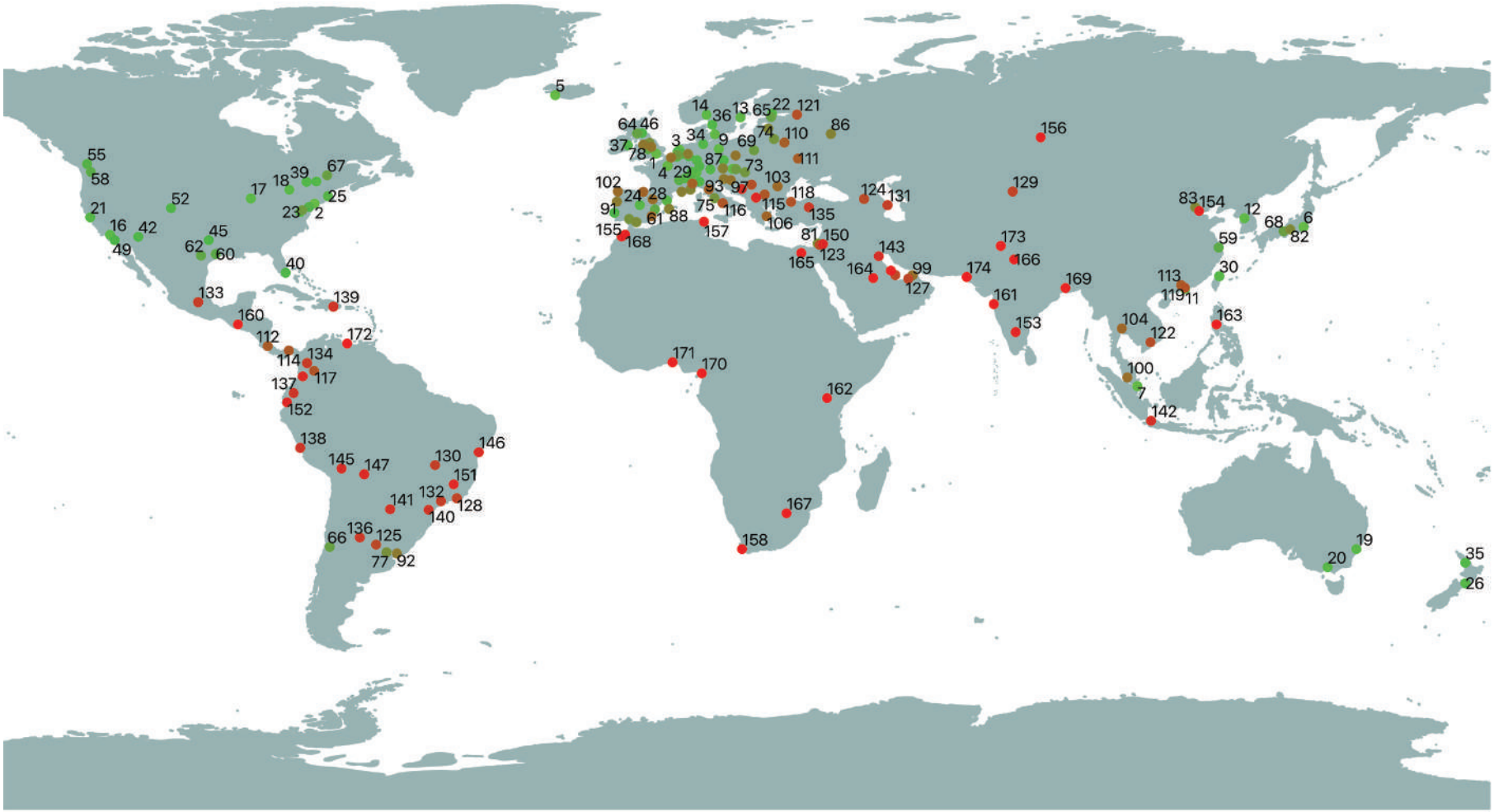


Table 12 shows the top 10 positions in the ranking for each dimension. In this way, the regional representativeness can be appreciated in each of the dimension.

Table 12. Top 10 by Dimension

	ECONOMY	HUMAN CAPITAL	SOCIAL COHESION
1	New York - USA	London - United Kingdom	Zurich - Switzerland
2	Los Angeles - USA	Los Angeles - USA	Bern - Switzerland
3	Tokyo - Japan	New York - USA	Taipei - Taiwan
4	San Francisco - USA	Boston - USA	Basel - Switzerland
5	Washington - USA	Berlin - Germany	Linz - Austria
6	Dallas - USA	Paris - France	Wellington - New Zealand
7	Chicago - USA	Moscow - Russia	Quebec - Canada
8	Paris - France	Washington - USA	Abu Dhabi - United Arab Emirates
9	Boston - USA	Tokyo - Japan	Eindhoven - Netherlands
10	Amsterdam - Netherlands	Chicago - USA	Helsinki - Finland

Throughout the years, New York City (United States) has topped the ranking in this dimension, thanks especially to its high GDP and to the number of publicly traded parent companies. Although its indicators mean that, for the moment, this city is difficult to beat, Tokyo—with characteristics that can put it at the top of this dimension—has been getting closer to the top position year after year.

In the top 10 for this dimension, there are seven US cities in total, due mainly to their high GDP per capita.

The city that ranks first in this dimension is London (United Kingdom) and it has achieved this thanks to it having the most top-level business schools, as well as having the highest number of universities within the best 500 in the world. It also has a large number of high schools, both state-run and private, and a high proportion of the population with secondary and higher education, as well as a broad cultural offering made up of theaters, museums and art galleries.

US cities also stand out in this dimension. Five of them are in its top 10.

Zurich (Switzerland) is the city with the highest rating in this dimension. Considered one of the cities with the best quality of life in the world in 2018 (Mercer Quality of Living ranking) and the second most sustainable in 2017 (Sustainable Cities Index), it has a low homicide and crime rate, one of the world's highest happiness indexes, and the highest score for an environment conducive to the development of women. Likewise, it has a low unemployment rate and a rather equitable distribution of income.

Of the top 10 cities in the ranking for this dimension, six are European and three of those are Swiss.

Table 12. Top 10 by Dimension (continued)

	THE ENVIRONMENT	GOVERNANCE	URBAN PLANNING
1	Reykjavík - Iceland	Bern - Switzerland	Toronto - Canada
2	Wellington - New Zealand	Geneva - Switzerland	New York - USA
3	Copenhagen - Denmark	Taipei - Taiwan	Vancouver - Canada
4	Montevideo - Uruguay	Melbourne - Australia	Kiev - Ukraine
5	Stockholm - Sweden	Los Angeles - USA	Chicago - USA
6	Tokyo - Japan	Berlin - Germany	Ottawa - Canada
7	Auckland - New Zealand	London - United Kingdom	Montreal - Canada
8	Oslo - Norway	Helsinki - Finland	Hong Kong - China
9	Asunción - Paraguay	Zurich - Switzerland	London - United Kingdom
10	Singapore - Singapore	San Diego - USA	Washington - USA

In this dimension, the same as in the previous year, the best-ranked cities are Reykjavík (Iceland) and Wellington (New Zealand), which are at the top of the EPI and have low levels of PM10 and PM2.5 pollution and contamination. Moreover, Reykjavík also stands out for its renewable water sources. This year, the entry of Asunción (Paraguay)—the city with the lowest CO_2 emissions—stands out in the top 10 of this ranking.

For another year, Bern (Switzerland) is ranked first in this dimension, displaying a good performance in the indexes of corruption perceptions, reserves per capita and number of embassies.

In this dimension, six other Western European cities also stand out among the first 10 positions in the ranking, in addition to two US cities.

Toronto (Canada) has obtained first place in this dimension. It is notable for its very well-developed infrastructure, with a large number of buildings and skyscrapers, and access to adequate sanitation facilities for almost the entire urban population. Furthermore, the number of people per household in the city is around the average.

It is worth noting that, in this dimension, seven of the 10 top-ranking cities are North American.

Table 12. Top 10 by Dimension (continued)

INTERNATIONAL OUTREACH

1	London - United Kingdom
2	Amsterdam - Netherlands
3	Paris - France
4	Singapore - Singapore
5	Berlin - Germany
6	Melbourne - Australia
7	Vienna - Austria
8	New York - USA
9	Miami - USA
10	Sydney - Australia

London (United Kingdom) leads this dimension, while Amsterdam (Netherlands) and Paris (France) are in second and third place respectively. London is among the cities with the highest number of airline passengers, something consistent with it having the largest number of air routes, and it also stands out for the significant number of hotels it has and the amount of international conferences that it organizes. Amsterdam stands out, just like the British capital, for the number of airline passengers and the large number of international conferences, while the French capital, for its part, is in fourth place in the ranking of cities with the most photographs uploaded to Panoramio and comes second for the organization of international meetings and congresses, as well as having a large number of hotels.

Of the top 10 cities for this dimension, five are European, two are North American and two are from Oceania.

TECHNOLOGY

1	Singapore - Singapore
2	Hong Kong - China
3	San Francisco - USA
4	Reykjavík - Iceland
5	Dubai - United Arab Emirates
6	Seoul - South Korea
7	Amsterdam - Netherlands
8	London - United Kingdom
9	Eindhoven - Netherlands
10	Copenhagen - Denmark

Singapore (Singapore) is in first place in this ranking. As is often said, in this city everything revolves around technology: it is the city that provides the fastest Internet speed to its residents, with three mobile phones for every two inhabitants; it has a high innovation culture index (Innovation Cities Index); almost 100% of its population has a mobile phone; and it has a large number of wireless access points globally. The second position for this dimension goes to Hong Kong (China), which stands out for its high Web Index rating and the amount of mobile phones per capita.

Of the cities that occupy the top 10 positions, three are east Asian and five are European.

MOBILITY AND TRANSPORTATION

1	Shanghai - China
2	Beijing - China
3	London - United Kingdom
4	Paris - France
5	New York - USA
6	Berlin - Germany
7	Vienna - Austria
8	Munich - Germany
9	Madrid - Spain
10	Taipei - Taiwan

Shanghai (China) is the first city in the ranking and excels mainly for the scope of its metro system, as well as being the city with the second-highest number of stations. Furthermore, it has one of the most developed bicycle systems and the number of air routes arriving there is the fourth-highest among the cities.

Six European and three Asian cities can be found in the top 10 positions for this dimension.

“THE GREAT CHALLENGES THAT CITIES FACE WILL NOT BE SOLVED SIMPLY WITH TECHNOLOGY. ALSO NECESSARY ARE A LONG-TERM VISION, A SINCERE DESIRE TO COLLABORATE, AND A CLEAR FOCUS ON THE NEEDS OF THE PUBLIC”.

Pascual Berrone

“A TRULY SMART CITY IS ONE THAT HAS AS ITS GOAL IMPROVING THE QUALITY OF LIFE OF ITS RESIDENTS, WHICH MEANS ENSURING ECONOMIC, SOCIAL AND ENVIRONMENTAL SUSTAINABILITY”.

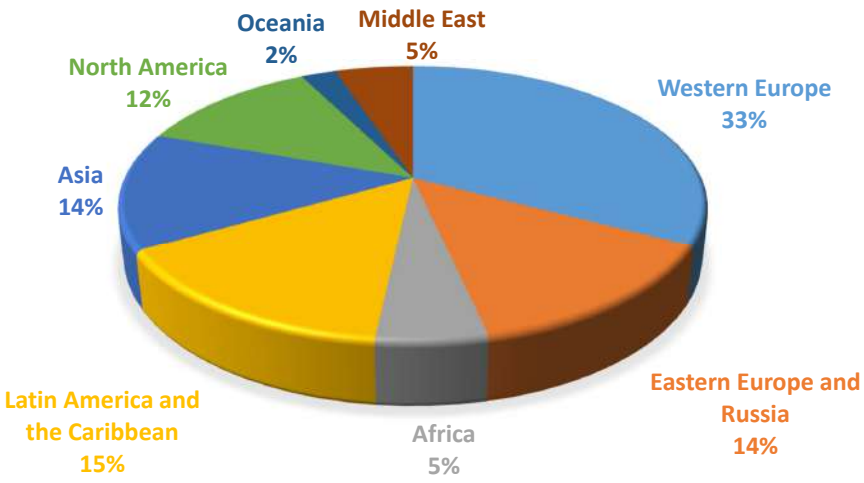
Joan Enric Ricart

Cities in Motion: Regional Ranking

In this section, there is an analysis by geographical region. One of the limitations of our index is the unequal coverage given to all the regions, due fundamentally to the scarcity of information available in certain areas for cities that are not capitals or do not have a significant population. Despite this limitation, every new edition of the **CIMI** attempts to widen the current coverage in a more equitable way, if new information is available.

Figure 4 shows the extent to which each region is represented in the ranking. As can be observed, 33% of the cities considered are from Western Europe, the most represented region.

Figure 4. Percentage of Cities From Each Geographical Region in the CIMI



In **Figure 5**, the 174 cities of the **CIMI** are divided into four groups according to their performance. The goal is to observe how the different regions are represented in the overall ranking in accordance with their performance.

The first group is made up of the 25% of the cities with the best performance (positions 1 to 43). Of this group, more than half are from Western Europe (55%), 25% are from North America, 11% from the Asia-Pacific region and 9% from Oceania. Although each region is not represented equally, we can see clearly that there are areas that are not represented in this group of cities with superior performance. This is the case with Latin America, eastern Europe, Africa and the Middle East.

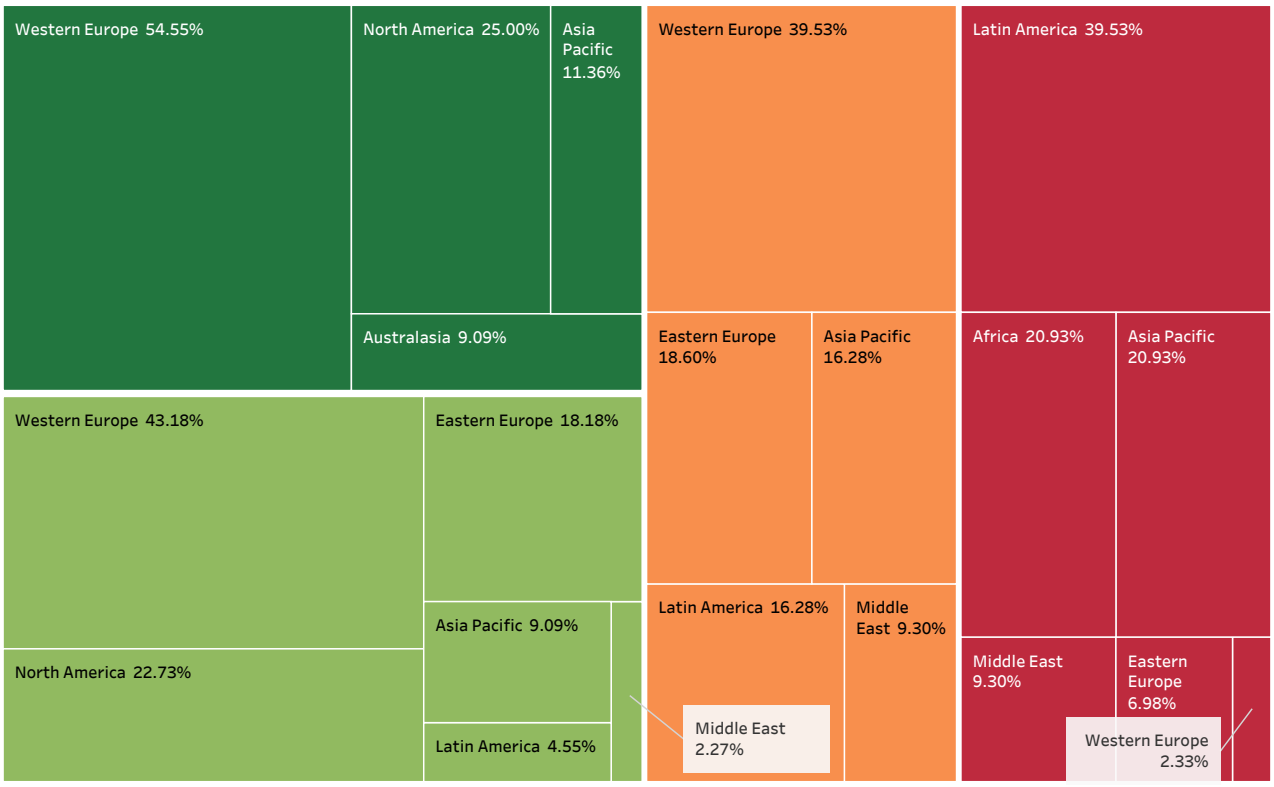
The second group of cities comprises those that are in the next 25%—that is, those in positions 44 to 86 of the overall ranking. This group is made up of cities from Western Europe (43%), North America (23%), eastern Europe (18%), the Asia-Pacific (9%) and Latin America and the Middle East, although with lower percentages.

The third group contains the cities located between positions 87 and 130 of the overall ranking. Here we find cities from Western Europe (40%), eastern Europe (19%), Latin America (16%), the Asia-Pacific (16%) and the Middle East (9%).

In the final group are the cities with the worst performance, since they occupy the positions from 131 to 174. Here, 40% are from Latin America, 21% from the Asia-Pacific, another 21% from Africa, 9% from the Middle East, almost 7% from eastern Europe and just over 2% from Western Europe.

It is interesting to note that North America is not represented in the worst-performing groups (the third and fourth), since all of the North American cities in the ranking occupy prominent positions. However, Western Europe has a presence in all four groups, perhaps given its wide geographical range. Latin America, for its part, does not have any cities in the best-performing group, and it is represented with a very low percentage in the second group. As an extreme case, it can be observed that all the African cities are part of the worst-performing group, without any of them achieving good positions in the ranking.

Figure 5. Geographical Regions According to Performance in the CIMI



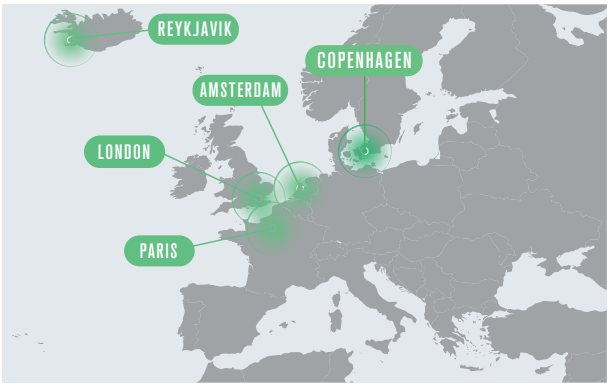
Below are the tables of the top five cities in each territory and their evolution in the global ranking of the past three years. Each map shows the cities of the region with the corresponding position that each city occupies in the territory. The colors of each city refer to their position in the overall ranking.

The global position rankings for 2016 and 2017 shown in the tables have been revised to take account of changes to the range of indicators used in this year's edition of the Cities in Motion Index publication so the rankings are not directly comparable to editions of previous years.

*** Please click on the maps for a larger and more detailed version.**

Western Europe Top Five

City	Regional position	Global position 2016	Global position 2017	Global position 2018
London - United Kingdom	1	1	1	1
Amsterdam - Netherlands	2	6	3	3
Paris - France	3	3	4	4
Reykjavík - Iceland	4	4	5	5
Copenhagen - Denmark	5	12	9	8



London leads the ranking in Europe and holds first place in the world classification. As in other years, the following top places are shared between Amsterdam, Paris and Reykjavík, which occupy the second, third and fourth positions respectively. This year Copenhagen occupies the last position in the top five. As can be seen in the previous table, all of the cities in the regional top five are in the top 10 in the overall ranking.

Eastern Europe Top Five

City	Regional position	Global position 2016	Global position 2017	Global position 2018
Prague - Czech Republic	1	51	48	47
Tallinn - Estonia	2	63	66	65
Warsaw - Poland	3	84	74	69
Bratislava - Slovakia	4	73	75	70
Budapest - Hungary	5	74	72	73

The eastern Europe ranking, as in previous years, is led by Prague. This city, as well as heading the region, is in the top 30 in the dimensions of social cohesion, the environment and international outreach. It is joined in the regional ranking by Tallinn, Warsaw, Bratislava and Budapest.

Latin America Top Five

City	Regional position	Global position 2016	Global position 2017	Global position 2018
Santiago - Chile	1	65	73	66
Buenos Aires - Argentina	2	83	65	77
Montevideo - Uruguay	3	97	97	92
San José - Costa Rica	4	102	108	112
Panama City - Panama	5	110	111	114

Over the years, the leadership of this region has been divided between the top two cities. This year, Santiago has beaten Buenos Aires, since it has had a better evolution, and it is in the top 30 for the dimensions of urban planning and the environment. Buenos Aires is in the top 30 for urban planning, the environment and international outreach but its poor position for the economy puts it below Santiago in the overall ranking. Montevideo, San José and Panama also stand out in the region.

As can be seen in the table and in the map above, most of the Latin American cities are worse than position 100 in the overall ranking, with the exception of Santiago, Buenos Aires and Montevideo. Latin America is one of the regions with the greatest urban concentration on the planet, so the challenges facing these cities are increasingly global, with problems common to all of them.

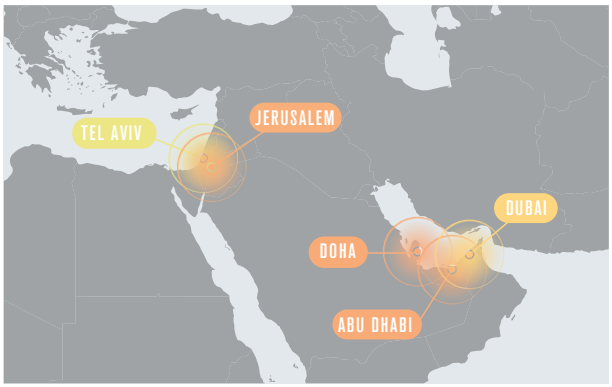
Asia-Pacific Top Five

City	Regional position	Global position 2016	Global position 2017	Global position 2018
Tokyo - Japan	1	7	6	6
Singapore - Singapore	2	8	8	7
Hong Kong - China	3	19	14	11
Seoul- South Korea	4	10	10	12
Taipei - Taiwan	5	28	30	30

Tokyo leads the ranking in the Asia-Pacific region and is ranked sixth overall, a position it has held for the past two years. The Japanese capital stands out particularly in the economy (position 3), the environment (position 6), and human capital (position 9). The second city in this classification is Singapore, which comes seventh in the overall ranking. It stands out in the dimensions of technology, international outreach and the environment, featuring in the top 10 for these three dimensions. Completing the regional ranking are Hong Kong, Seoul and Taipei.

Middle East Top Five

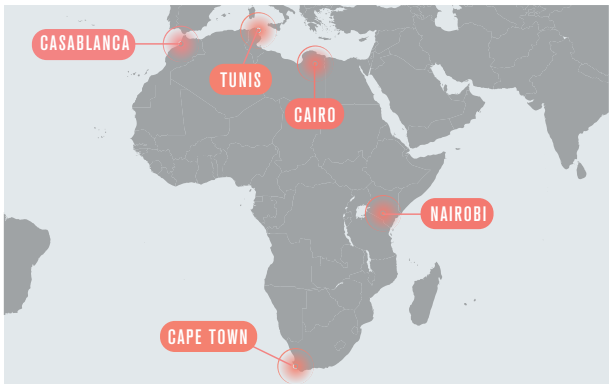
City	Regional position	Global position 2016	Global position 2017	Global position 2018
Tel Aviv - Israel	1	77	79	81
Dubai - United Arab Emirates	2	107	103	99
Jerusalem - Israel	3	115	118	123
Doha - Qatar	4	126	127	126
Abu Dhabi - United Arab Emirates	5	129	129	127



Tel Aviv heads the Middle East classification and, in turn, is in position 81 in the general ranking. This city stands out for its good performance in the dimensions of the environment (41), urban planning (34) and technology (42). It is followed by Dubai, which is noteworthy for occupying the fifth position in the technology ranking. Closing the top five of the region are Jerusalem, Doha and Abu Dhabi.

Africa Top Five

City	Regional position	Global position 2016	Global position 2017	Global position 2018
Casablanca - Morocco	1	153	152	155
Tunis - Tunisia	2	156	157	157
Cape Town - South Africa	3	146	151	158
Nairobi - Kenya	4	163	162	162
Cairo - Egypt	5	165	163	165



Casablanca heads the Africa's ranking, followed by Tunis. Cape Town, Nairobi and Cairo complete the list of the top five in the region. All of the African cities included in the index are among the lowest positions in the overall ranking.

North America Top Five

City	Regional position	Global position 2016	Global position 2017	Global position 2018
New York - United States	1	2	2	2
Los Angeles - United States	2	16	15	16
Chicago - United States	3	20	21	17
Toronto - Canada	4	14	13	18
San Francisco - United States	5	11	17	21

New York leads the North America ranking and is also in second position in the overall classification. In the regional top five, it is followed by Los Angeles, in position 16 in the general ranking, and by Chicago, Toronto and San Francisco. It should be noted that, as in previous years, Toronto is the only city that is always in the region's top ranking and is not in the United States.

As mentioned previously and as can be seen in the table above, North American cities occupy some of the top places in the overall ranking. In the case of US cities, six of the 16 included in the study are among the top 30 at a global level.

Oceania Top Three

City	Regional position	Global position 2016	Global position 2017	Global position 2018
Sydney - Australia	1	22	18	19
Melbourne - Australia	2	17	20	20
Wellington - New Zealand	3	23	23	26

The Oceania ranking is always contested by the top two cities. Although Sydney is leading on this occasion, Melbourne also has a significant performance, not only in the region but also at a global level. Sydney is noteworthy for its rather homogeneous performance across the dimensions, which leads it to be situated around about position 25 in each one of them. Melbourne, for its part, has a somewhat lower performance in some dimensions but it stands out in governance and international outlook, where it is in positions 4 and 6 respectively.

Completing the regional ranking is Wellington, which performs very well—especially in the environment dimension, where it is in second place, and in social cohesion, where it is sixth.

Noteworthy Cases

This section describes some noteworthy cases. See the graphical analysis in **Appendix 2** of the 174 cities included in the **CIMI**.

AMSTERDAM

Capital of the Netherlands, this is the country's largest city and a major financial and cultural center, with international outreach. The combination of financial technology, energy efficiency and culture makes it an important European power. Some 90% of its households have bicycles and it has an advanced system of automated services for the public use of shared bicycles. In addition, it has put forward a project to ban gasoline and diesel cars by the year 2025 and thus become Europe's first zero-emissions city. In the overall and regional rankings, it is in positions 3 and 2 respectively. It performs well overall and stands out especially in the economy, technology, urban planning, international outreach, and mobility and transportation, dimensions in which it is among the top 20.

BARCELONA

This is the second best-placed Spanish city and is in position 28 in the overall ranking. It performs well in almost every dimension and stands out especially in governance, urban planning, international outreach, technology, and mobility and transportation, dimensions in which it is in the top 30. Barcelona is noteworthy for its growing population of industrial designers and its prominent use of smartphones, and it is a pioneer in traffic management using big data. It is considered one of the 25 most technological cities in the world, according to Business Insider and 2thinknow, and it is carrying out the C MobILE project, within the framework of cooperative intelligent transport systems, to increase awareness of the use of the road network. The navigation system can issue an alert if an ambulance, the police or a fire engine is coming, if the traffic lights are about to turn red or if there is a pedestrian on the sidewalk who is going to cross. These systems have been designed to address the specific mobility challenges in eight pilot cities in Europe, and Barcelona is one of them.

BUENOS AIRES

This is the capital and the most populous city of the Argentine Republic and the most visited city in South America. It has the second-highest number of skyscrapers in the region and is the best-placed Latin American city in the Global Liveability Index (The Economist Intelligence Unit). Buenos Aires is in 25th place in the world ranking of cities to choose to study in (QS Best Student Cities 2018, drawn up by Quacquarelli Symonds) and in that year it succeeded in being the favorite among Spanish-speaking cities. It is in position 77 in the overall ranking and second in its region, behind Santiago. It stands out, at the regional level, in the dimensions of the environment, governance, urban planning, and international outreach. Furthermore, it is carrying out urban planning projects aimed at improving the road system in order to connect different urban areas and alleviate the current traffic problems.

LONDON

This is the capital and the most populous city of the United Kingdom. It makes up the largest urban area in the country and holds first place in the overall ranking. The British capital hosts more start-ups and programmers than almost any other city in the world and has an open data platform (London Datastore) that is used by more than 50,000 individuals, companies, researchers and developers every month. Its innovation with regard to transportation has led it to install the Heathrow pods, capsules that work as a means of transit to connect with Heathrow Airport, one of the busiest on the planet. Its investment in public transport is pursuing one of Europe's biggest construction projects (the Crossrail project), which will add 10 new train lines to the city to connect with 30 already existing stations toward the end of 2019. London is a well-placed city in almost all the dimensions: it has obtained first place for human capital and international outreach and is in the top 10 for the dimensions of mobility and transportation, governance, technology, and urban planning. Its worst performance can be seen in the dimension of social cohesion (position 45).

MADRID

This is the capital of Spain and the country's most populous city. It is also the first Spanish city in the overall ranking, where it occupies position 24. It stands out in the dimensions of mobility and transportation (ninth place) and in international outreach (17th). It is committed to the development of a sustainable city. The platform MiNT (Madrid Inteligente or "Smart Madrid") lets residents use their smartphones to inform the council of any incident in the management and quality of urban public services, such as a sidewalk in poor condition or a faulty light in a streetlamp, to make the city more sustainable. The city also has the citizen participation platform Decide Madrid ("Madrid Decides"), launched to contribute to the direct democracy in the city's management. The platform allows residents to decide on a wide range of issues related to the city and has served as a model for other cities.

NEW YORK

This is one of the largest and most populous urban agglomerations in the world and is the second most densely populated city in North America (after Mexico City). This year, it is in second place in the overall ranking, behind London, but it enjoys the leading position in the economy dimension. It is the world's most important economic center and is the city with the highest GDP. The Big Apple has almost 7,000 high-tech firms and stands out for its integrated technology services, such as the free Wi-Fi service LinkNYC. Its good general performance is demonstrated in the different dimensions of the **CIMI** since, as well as heading the dimension of the economy, it has succeeded in being among the top places for human capital (3), urban planning (2), international outreach (8), technology (11), and mobility and transportation (5).

OSLO

This Scandinavian city occupies position 14 of the overall ranking and is eighth in the environment dimension. It is one of the cities in the **CIMI** with the fastest growth in the period from 2016 to 2018, an evolution that is hardly surprising since it plans to become the smartest, greenest, most inclusive and most creative city for all its residents. Some of its projects range from testing electric buses, construction sites with zero emissions and the remodeling of existing buildings to the development of waste management systems and green energy based on circles. Any service oriented to the residents that can be digitized will be digitized, and the needs of the public are the guiding principles for the city's development.

PARIS

French capital is the most important financial center in Europe, at the heart of which are the headquarters of almost half of the largest French companies, as well as the headquarters of 20 of the 100 largest companies in the world. The City of Light works to promote clean transport through the use of bicycles and electric vehicles and it is a city characterized by open innovation, which gives its inhabitants and other actors control and access to the city's data flows. Through the application of the Internet of Things (IoT), it tries to optimize the flows of people and vehicles in the city. The Grand Paris Express project is one of the biggest overhauls of transport in Europe, which will rethink and redesign the transport network in the city's metropolitan area, adding four additional metro lines, 200 kilometers of new rail lines and 68 completely new interconnected stations, all with a 100% automatic metro system. Paris is, together with London, one of the most important financial hubs in Europe. It is in fourth place in the overall ranking and stands out in the economy (position 8), human capital (6), international outreach (3), technology (15), and mobility and transportation (4).

REYKJAVIK

Iceland's most populous city is the country's capital—where half of its population live—and the northernmost city on the planet. Despite being one of the "smallest cities," since its incorporation in the **CIMI**, it has stood out by occupying position 5 in the overall ranking and, for the second consecutive year, by heading the dimension of the environment. Iceland is the country with the world's second-best performance according to the Environmental Performance Index (EPI) for 2018. More than 99% of electricity production and almost 80% of its total energy production come from hydroelectric and geothermal energy, which makes its buildings naturally green. It has a tacit commitment to the environment to promote the use of renewable energy and reduce its dependence on fossil fuels. Reykjavík put forward a climate policy document with an action plan in which goals are established for a city with zero carbon emissions by 2040.

SANTIAGO

This city occupies position 66 in the overall ranking, is the leader in its region and stands out in the dimensions of urban planning and the environment. Together with Buenos Aires, it is the most innovative city in Latin America. Smartcity Santiago is Chile's first prototype of a smart city, designed in response to unplanned urbanization and the need to improve the inhabitants' quality of life. The future is forged on the basis of projects that have their maximum inspiration in innovation, services, sustainability and taking care of public space.

SINGAPORE

It occupies position 7 in the overall ranking and is the top city in its region and in the technology dimension, as well as occupying position 4 in international outreach. In Singapore, everything revolves around technology: it has a fiber-optic network the length and width of the island and up to three mobiles for every two residents, and it has robot hospitals (with human staff and robots), autonomous taxis (with no driver), and vertical gardens and farms that regulate the temperature by absorbing and dispersing heat while collecting rainwater. In this city, the authorities have a commitment to innovation. It is said that technology triumphs over politics.

TOKYO

This is the capital of Japan, the most populous urban agglomeration in the world and one of the cities with the highest rate of labor productivity. It is considered the world's most innovative city (Business Insider and 2thinknow) and is in the top 10 of the Global Financial Centres Index (Z/Yen) for 2018. In the **CIMI**, it is sixth in the overall ranking, leading the Asian region. It stands out particularly in the economy (position 3), human capital (9) and the environment (6). In addition, it is in the top 30 for the dimensions of urban planning, mobility and transportation, and technology.

TORONTO

This city occupies position 18 in the overall ranking and is the top city for urban planning. It is a city that, in its commitment to urban planning and technology, houses 30% of Canada's technology firms, most of which have fewer than 50 employees. Since 2017, it has been developing an urban-planning project with which it intends to create new houses in multifamily buildings designed to adapt better to families with children and adolescents (Growing Up: Planning for Children in New Vertical Communities). In Toronto, the authorities consider that a successful city is often measured by its diversity and, in that context, the number of children is shown as a measure of success. If a city is built that allows children and young people to thrive and develop safely, then it will be an inclusive and sustainable city for all that is being built. Furthermore, the city is working to convert disused areas into minimetropolises full of life. The smart city project being prepared by Sidewalk Labs, a firm linked to Google, seeks to develop a smart district in the eastern part of the Canadian city, on the shores of Lake Ontario. Via new technologies, the aim is to develop a model of a connected city based on the collection of data by means of sensors that can shed light on aspects of traffic, noise, air quality, waste collection or the performance of the electrical grid. The goal of the technology project is to turn Toronto into a model of a sustainable city in which green construction plans play the leading role.

ZURICH

The largest city in Switzerland occupies position 15 in the overall ranking. It is the top city in the dimension of social cohesion and stands out in governance, where it has achieved ninth place. It is a city with low crime and homicide rates and with a high rating for being women-friendly, as well as being cosmopolitan and open. Its great cultural diversity forms part of its identity: its foreign population, around 32%, comes from more than 100 nations. Zurich is the world's sixth most sustainable city (Sustainable Cities Index, 2018) and has the second-highest quality of life (Quality of Living city ranking, 2018).

Evolution of the Cities in Motion Index

A city's transformation is vitally important in understanding the focus of its development target. Thus, Table 13 sets out the evolution of the index during the past three years with respect to the top 50 cities in the 2018 **CIMI** ranking.

The results show a lot of stability in almost all the cities, with no very sudden changes, neither in a positive nor in a negative direction. However, two US cities stand out with a positive evolution in the period from 2016 to 2018: Dallas, which rises 11 places due to its better performance in human capital, and San Diego, which goes up eight positions because of a better performance in the economy. Moreover, Frankfurt and Oslo rise three and four places respectively while, in the case of the Spanish cities, Madrid has gone up one place and Barcelona has fallen one.

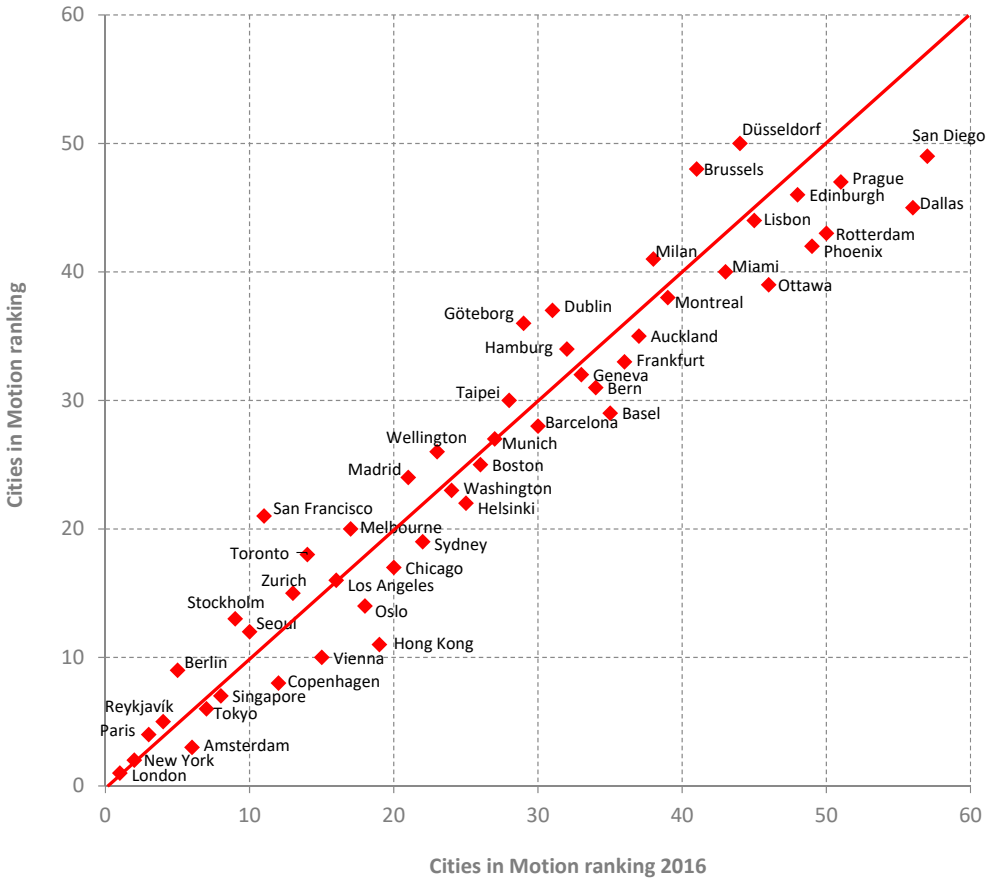
Within the group of cities with a negative evolution in the period from 2016 to 2018, San Francisco is noteworthy, falling 10 positions: despite its good performance in general terms, it has not achieved the same success in the dimensions of the environment and mobility and transportation. Another successful city that has fallen—down four places—is Toronto, whose general evolution is negative due to its performance in specific dimensions, including those of social cohesion and mobility and transportation.

Table 13. Evolution of the Index for the Top 50 Cities in the 2018 Ranking (Past Three Years)

City	2016	2017	2018	2016-2017	2017-2018
London - United Kingdom	1	1	1	0	0
New York - USA	2	2	2	0	0
Amsterdam - Netherlands	6	3	3	3	0
Paris - France	3	4	4	-1	0
Reykjavík - Iceland	4	5	5	-1	0
Tokyo - Japan	7	6	6	1	0
Singapore - Singapore	8	8	7	0	1
Copenhagen - Denmark	12	9	8	3	1
Berlin - Germany	5	7	9	-2	-2
Vienna - Austria	15	11	10	4	1
Hong Kong - China	19	14	11	5	3
Seoul - South Korea	10	10	12	0	-2
Stockholm - Sweden	9	12	13	-3	-1
Oslo - Norway	18	19	14	-1	5
Zurich - Switzerland	13	16	15	-3	1
Los Angeles - USA	16	15	16	1	-1
Chicago - USA	20	21	17	-1	4
Toronto - Canada	14	13	18	1	-5
Sydney - Australia	22	18	19	4	-1
Melbourne - Australia	17	20	20	-3	0
San Francisco - USA	11	17	21	-6	-4
Helsinki - Finland	25	24	22	1	2
Washington - USA	24	22	23	2	-1
Madrid - Spain	21	25	24	-4	1
Boston - USA	26	28	25	-2	3
Wellington - New Zealand	23	23	26	0	-3
Munich - Germany	27	26	27	1	-1
Barcelona - Spain	30	27	28	3	-1
Basel - Switzerland	35	31	29	4	2
Taipei - Taiwan	28	30	30	-2	0
Bern - Switzerland	34	34	31	0	3
Geneva - Switzerland	33	32	32	1	0
Frankfurt - Germany	36	36	33	0	3
Hamburg - Germany	32	29	34	3	-5
Auckland - New Zealand	37	33	35	4	-2
Göteborg - Sweden	29	37	36	-8	1
Dublin - Ireland	31	35	37	-4	-2
Montreal - Canada	39	40	38	-1	2
Ottawa - Canada	46	38	39	8	-1
Miami - USA	43	39	40	4	-1
Milan - Italy	38	41	41	-3	0
Phoenix - USA	49	42	42	7	0
Rotterdam - Netherlands	50	43	43	7	0
Lisbon - Portugal	45	44	44	1	0
Dallas - USA	56	50	45	6	5
Edinburgh - United Kingdom	48	47	46	1	1
Prague - Czech Republic	51	48	47	3	1
Brussels - Belgium	41	45	48	-4	-3
San Diego - USA	57	55	49	2	6
Düsseldorf - Germany	44	49	50	-5	-1

Figure 6 below shows the positions of the top 50 cities in the ranking in 2016 and 2018. Those cities that show a positive evolution are below the 45-degree angle formed by the diagonal, while those that did not experience such an evolution are above the line. As could be observed in **Table 13**, there is no city among the top 50 that experienced a very sudden variation in the period being considered, with the exception of San Francisco, which has dropped 10 positions. The rest show a rather stable evolution over time.

Figure 6. Evolution of the Index for the Top 50 Cities in the 2018 Ranking



Cities in Motion Compared With Other Indexes

In this section, we conduct a comparative study of the **CIMI** and other indexes. **Table 14** shows the top 10 cities in this ranking (2018) and those in six other indexes that have been considered. Cities that also appear in the **CIMI** are shaded.

While the classifications being studied vary in terms of methodology and indicators, they all agree that a city is more powerful, prosperous, and competitive if it manages to develop in its various dimensions: from the economy and finance, via the ease of ensuring the creation of businesses, the quality of life, and the use of high technology, to its cultural importance, which could be measured by how it promotes music and fashion. Moreover, it can be noted that all of the cities in the **CIMI** frequently appear in some of the other indexes under consideration, with the exception of Reykjavík.

The city of Singapore, which occupies position 7 in the **CIMI** and is in the top 10 of four of the six other rankings analyzed, stands out for showing a high performance in the dimensions of international outreach, the environment, governance, and the economy. In terms of technology, as mentioned previously, it shows a very good performance and heads the dimension.

New York, London, Paris, Tokyo, Vienna and Copenhagen, for their part, also appear frequently in other classifications with respect to the 10 most prosperous cities or those with the best quality of life in the world

As can be seen, all the cities in our top 10, with the exception of Reykjavík, appear in the top positions of the indexes under consideration. The Icelandic city is often excluded from many rankings due to the size of its population although, despite this, it has been demonstrating its capabilities and strengths over the years and has managed to stand out among the best cities. Unlike many of the indexes with which it is compared, the **CIMI** takes into account a greater geographical coverage.

Finally, it can be observed that the top two positions in the Global Financial Centers Index (Z/Yen) and the Global Power City Index (Mori Memorial Foundation) coincide exactly with the top two of the **CIMI**.

Table 14. Comparison With Other Indexes (Top 10)

Ranking by city	CIMI 2018 (IESE)	Global Cities Index 2018 (A.T. Kearney)	Global Financial Centres Index (GFCI) 2018 (Z/Yen)	Global Power City Index 2018 (MMF)	Quality of Living City Ranking 2018 (Mercer)	Global Liveability Index 2018 (*Economist* Intelligence Unit)	Sustainable Cities Index 2018 (Arcadis)
1	London	New York	London	London	Vienna	Vienna	London
2	New York	London	New York	New York	Zurich	Melbourne	Stockholm
3	Amsterdam	Paris	Hong Kong	Tokyo	Munich	Osaka	Edimburgh
4	Paris	Tokyo	Singapore	Paris	Auckland	Calgary	Singapore
5	Reykjavík	Hong Kong	Tokyo	Singapore	Vancouver	Sydney	Vienna
6	Tokyo	Los Angeles	Shangai	Amsterdam	Düsseldorf	Vancouver	Zurich
7	Singapore	Singapore	Toronto	Seoul	Frankfurt	Toronto	Munich
8	Copenhagen	Chicago	San Francisco	Berlin	Geneva	Tokyo	Oslo
9	Berlin	Beijing	Sydney	Hong Kong	Copenhagen	Copenhagen	Hong Kong
10	Vienna	Brussels	Boston	Sydney	Basel	Adelaide	Frankfurt

Cities in Motion:
City Ranking by Population

This section presents a ranking of cities according to their population, obtained after producing a classification of the 174 cities included in the index according to this value. The cities were grouped by considering various sources, such as The Economist and the United Nations. **Table 15** shows the various categories and the number of **CIMI** cities included in each.

Table 15. Classification of Cities According to Their Population (Number of Inhabitants)

Category		Number of cities
Less than 600,000	Smallest cities	12
Between 600,000 and 1 million	Small cities	13
Between 1 million and 5 million	Medium cities	93
Between 5 million and 10 million	Large cities	26
More than 10 million	Megacities	30

RANKING OF THE "SMALLEST CITIES"

Like the previous year, the top five so-called "smallest cities" are headed by Reykjavík, which comes fifth in the overall ranking and fourth in the Western Europe region. In the general ranking, this city has a far superior performance compared to the other cities of a similar size, which are more than 20 positions below. In second place in this classification is Wellington, which, along with Reykjavík, also heads the ranking for the environment. The top five are completed by three Swiss cities—Bern, Geneva and Basel—which stand out for their good performance in the governance dimension.

Top Five Cities With Fewer Than 600,000 Inhabitants

City	Position by size	Global position 2016	Global position 2017	Global position 2018
Reykjavík - Iceland	1	4	5	5
Wellington - New Zealand	2	23	23	26
Basel - Switzerland	3	35	31	29
Bern - Switzerland	4	34	34	31
Geneva - Switzerland	5	33	32	32

RANKING OF THE "SMALL CITIES"

The following table shows the top five "small cities," or those that have a population of between 600,000 and 1 million inhabitants. This ranking is led by Edinburgh, followed by Quebec, newly added to the index this year. The third and fourth places go to Bratislava and Vilnius respectively, and Málaga completes the ranking. With the exception of Vilnius (capital of Lithuania), which stands out in the environment and human capital, the other four small cities excel for their performance in social cohesion.

Top Five Cities of Between 600,000 and 1 Million Inhabitants

City	Position by size	Global position 2016	Global position 2017	Global position 2018
Edinburgh - United Kingdom	1	48	47	46
Quebec - Canada	2	64	64	67
Bratislava - Slovakia	3	73	75	70
Vilnius - Lithuania	4	71	76	74
Málaga - Spain	5	76	78	80

RANKING OF THE "MEDIUM CITIES"

Below are the top five "medium cities"—that is, those that have between 1 million and 5 million inhabitants. This ranking is led by Amsterdam, followed by Copenhagen, Vienna, Stockholm and Oslo, which are in the top 20 of the overall ranking and stand out in almost every dimension.

Top Five Cities of Between 1 Million and 5 Million Inhabitants

City	Position by size	Global position 2016	Global position 2017	Global position 2018
Amsterdam - Netherlands	1	6	3	3
Copenhagen - Denmark	2	12	9	8
Vienna - Austria	3	15	11	10
Stockholm - Sweden	4	9	12	13
Oslo - Norway	5	18	19	14

RANKING OF THE "LARGE CITIES"

Below is shown the ranking of the "large cities," those that have between 5 million and 10 million inhabitants. Singapore heads this classification, followed by Berlin and Hong Kong, while Toronto and Chicago occupy the final positions.

Top Five Cities of Between 5 Million and 10 Million Inhabitants

City	Position by size	Global position 2016	Global position 2017	Global position 2018
Singapore - Singapore	1	8	8	7
Berlin - Germany	2	5	7	9
Hong Kong - China	3	19	14	11
Chicago - United States	4	20	21	17
Toronto - Canada	5	14	13	18

RANKING OF THE "MEGACITIES"

The "megacities" ranking includes those cities with a population of more than 10 million inhabitants. This year, it is headed by London, followed by New York, Paris, Tokyo and Seoul, which are in the overall top 20 and stand out in almost every dimension, with the exception of that of social cohesion.

Top Five Cities of More Than 10 Million Inhabitants

City	Position by size	Global position 2016	Global position 2017	Global position 2018
London - United Kingdom	1	1	1	1
New York - United States	2	2	2	2
Paris - France	3	3	4	4
Tokyo - Japan	4	7	6	6
Seoul - South Korea	5	10	10	12

Cities in Motion: Analysis of Dimensions in Pairs

In this section, the position of cities with respect to two dimensions is analyzed simultaneously with the aim of observing whether there is any relationship between the two. Furthermore, cities are analyzed by population, according to the categories analyzed in the previous section.

Figure 7 examines the dimensions of the economy on the y-axis and social cohesion on the x-axis. As can be observed, the cities of fewer than 600,000 inhabitants (the smallest cities) show a high performance in social cohesion and are located on the right of the figure. In contrast, the megacities are located on the left and their performance in this dimension is low. The top part of the figure shows the cities with a good performance in the economy, such as Tokyo, New York, Los Angeles, San Francisco, London and Paris, while in the lower part we have cities that are in the lowest positions of the ranking in the economy, such as Asunción, Córdoba and Rosario. The most conspicuous case is that of Caracas, which is at the bottom of both rankings and appears in the lower left corner.

Figure 7. Economy and Social Cohesion Dimensions

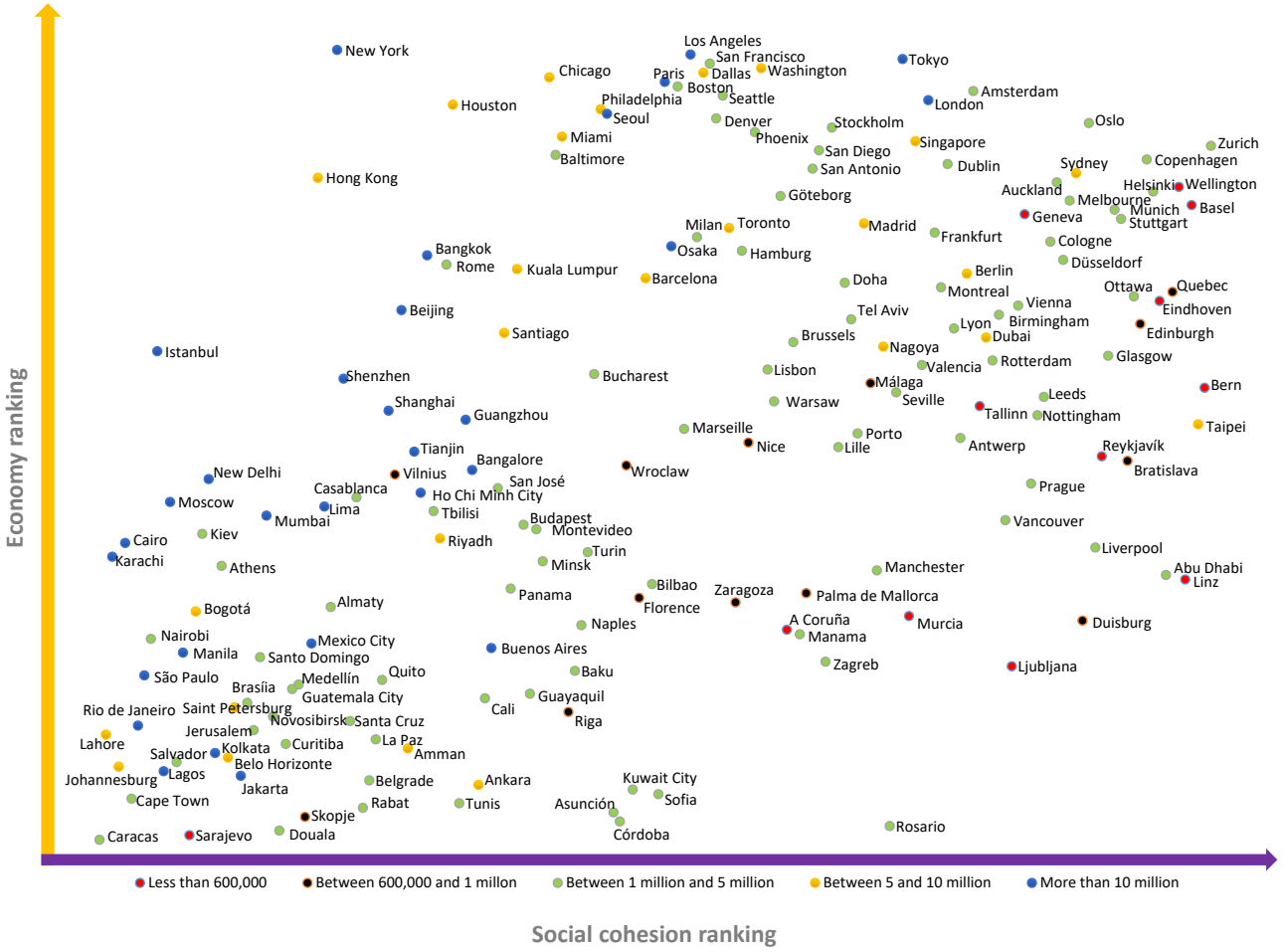


Figure 8 analyzes the dimensions of the economy and the environment. The former is shown on the y-axis and latter on the x-axis.

In the upper left are the Asian and US cities, which stand out because they perform well in the dimension of the economy but whose performance is deficient in that of the environment. This information could lead to the belief that a high level of economic development is detrimental to the well-being of the environment if cities do not take ecological criteria into account during that development. However, on the opposite side—the upper right—appear those cities that have a good performance in both dimensions. This group includes a large number of European cities, such as Stockholm, Copenhagen, Amsterdam, London, Oslo and Zurich, as well as Asian cities such as Tokyo and Seoul, and cities from Oceania such as Sydney and Wellington. In the lower left corner are those cities with a low performance level in these two dimensions, such as Lagos, Kolkata, Lahore and Rabat. Finally, the lower right-hand side shows the cities with low economic development but a good performance in the environment, with cities such as Asunción, Riga, Santa Cruz and Buenos Aires. In this case, a conclusion could be drawn that cities with less economic development preserve the environment better.

Figure 8. Economy and Environment Dimensions

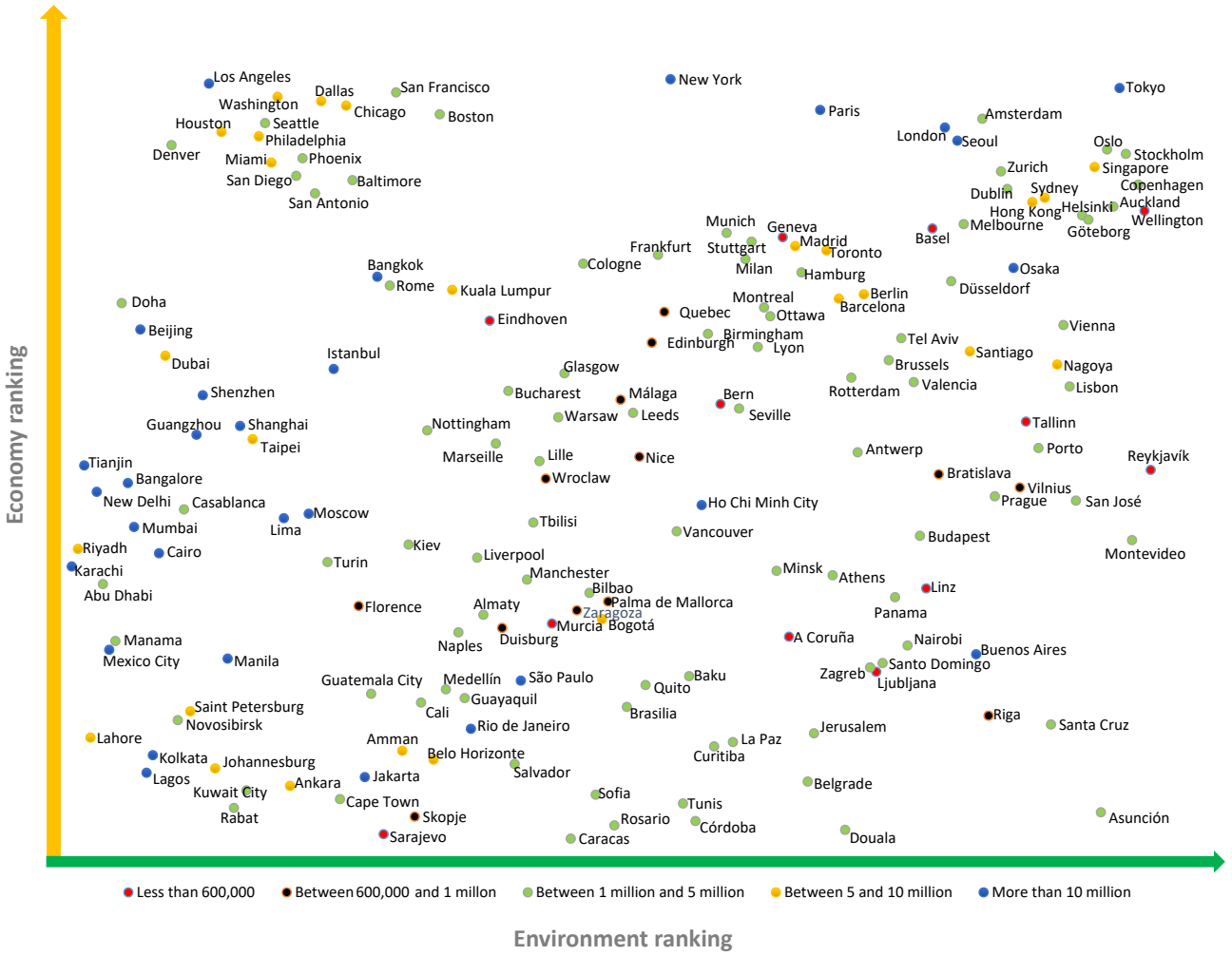


Figure 9 shows the dimension of mobility and transportation on the y-axis and that of the environment on the x-axis. The upper left shows cities that perform well in mobility and transportation but poorly in the environment dimension. This is the case with some Asian cities, such as Beijing, Shanghai, Shenzhen, Tianjin and Taipei, and some US cities, such as Chicago. The upper right-hand side shows the group of cities that show good management in both dimensions, such as the Swiss city of Basel and the Scandinavian cities of Oslo and Stockholm. For their part, Madrid and Barcelona also show a good performance in both dimensions, along with other European cities such as Paris, London and Berlin. The lower left shows those cities with a low level of development in terms of mobility and transportation as well as the environment, the main examples being Lagos, Manila, Mumbai, Bangalore and Kolkata. Finally, the lower right-hand side shows the group of cities with a high level of environmental development but a low level in mobility and transportation, made up of cities belonging to Central and South America, such as Asunción, Montevideo, Santa Cruz, San José and Buenos Aires.

Figure 9. Mobility and Transportation and Environment Dimensions

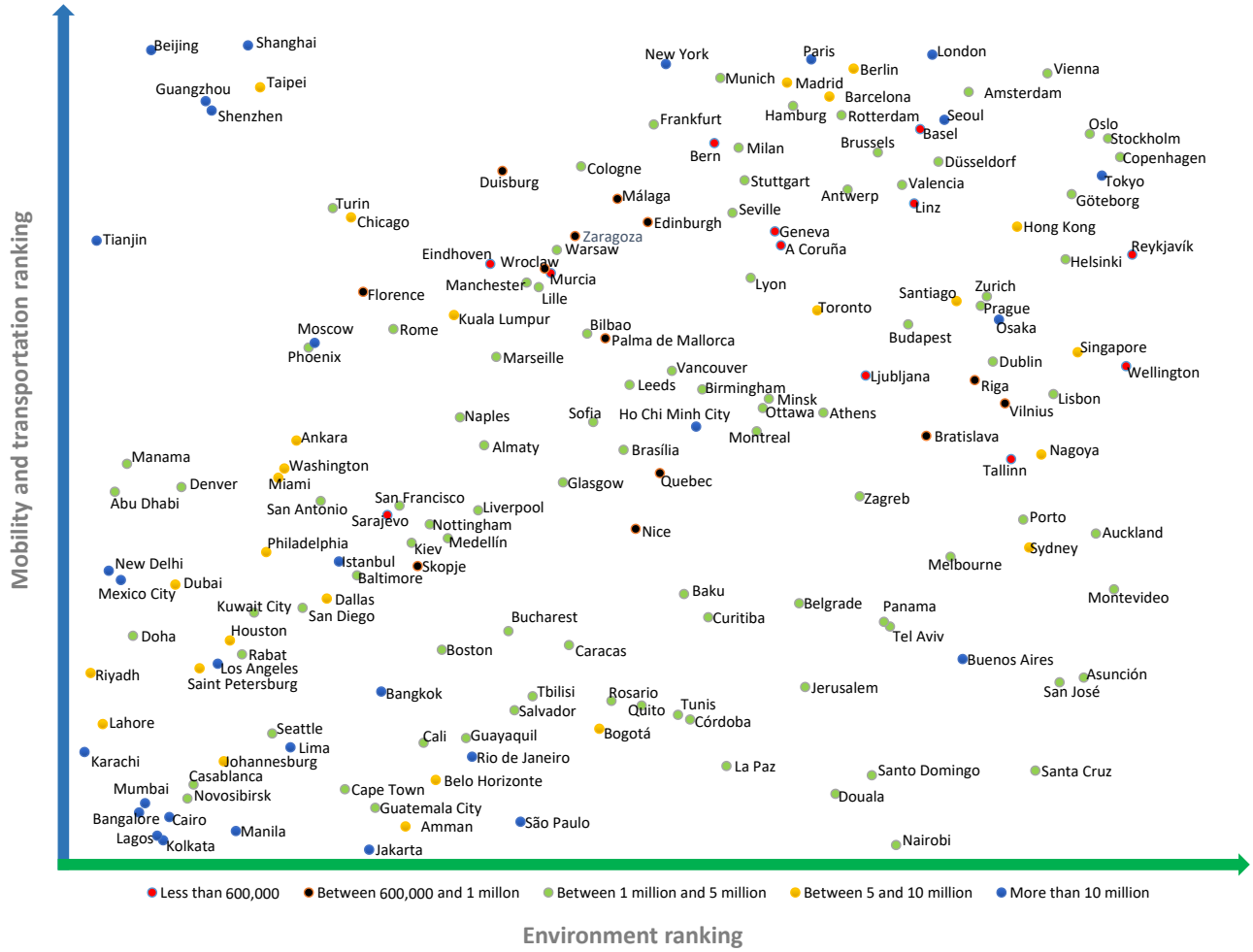
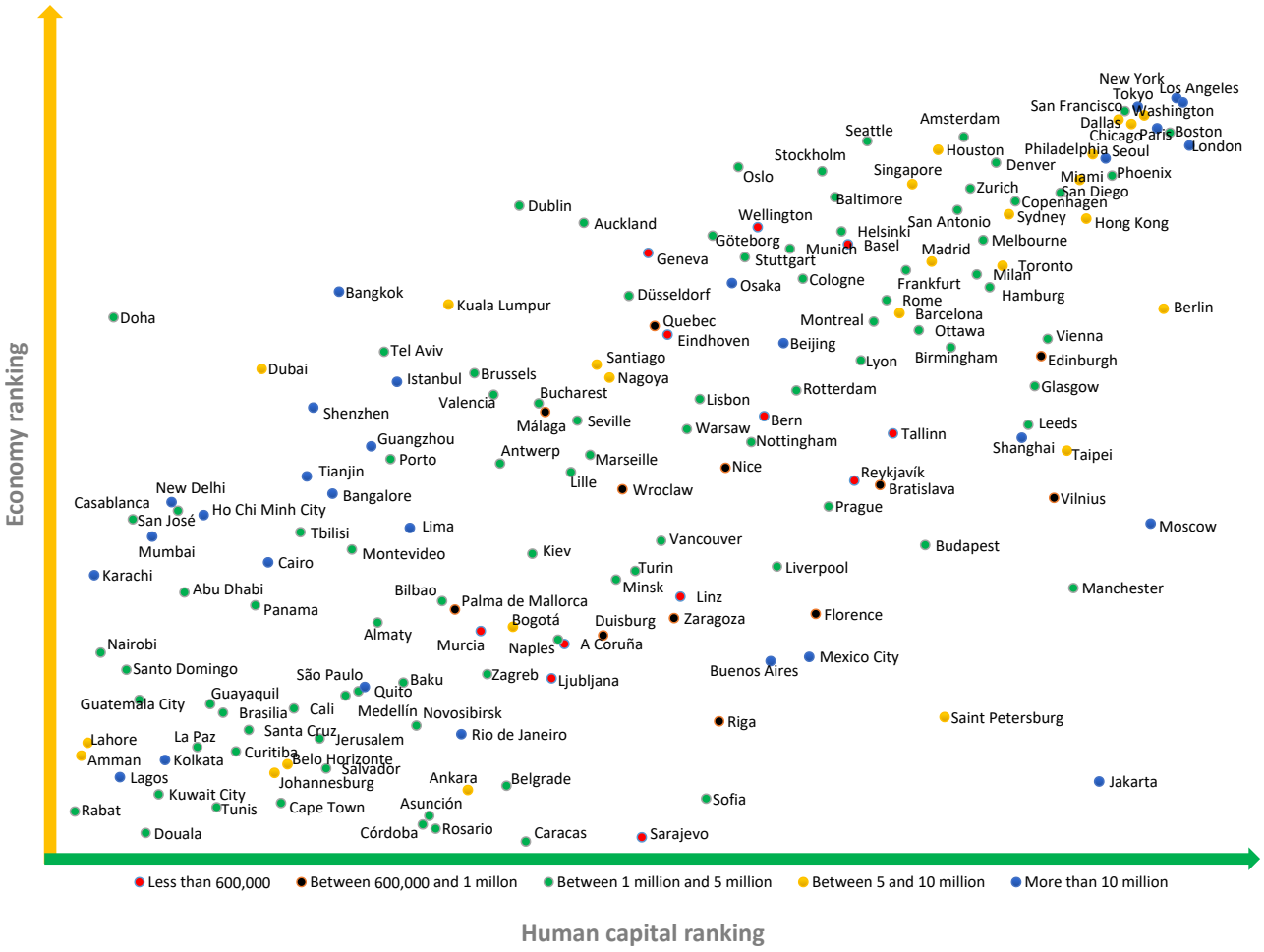


Figure 10 shows the relationship between the economy and human capital dimensions. As can be observed, those cities with a good position in the economy also do well in human capital and are located in the upper right-hand part of the figure. These are cities in the United States, such as Los Angeles, New York, San Francisco and Dallas; cities in Europe, such as London, Paris, Copenhagen and Zurich; and in Asia and Oceania, such as Tokyo, Hong Kong and Sydney. With some exceptions, such as Jakarta, Manchester and Saint Petersburg, it can be gathered from the figure that those cities that perform poorly in the economy are unlikely to perform well in human capital. On the contrary, it is most common for them to perform badly in both dimensions, as in the case of Rabat, Douala, Cape Town, Lahore and Amman.

With respect to the size of the population, it can be inferred that cities with fewer than 600,000 inhabitants do not show a very poor performance in human capital. Finally, we observe that cities with a good performance in human capital also, generally speaking, perform well in the economy and vice versa.

Figure 10. Economy and Human Capital Dimensions



In **Figure 11**, we have the relationship between the technology and social cohesion dimensions. Here we observe that, with the exception of London and Tokyo, the most-populous cities that achieve a good performance in technology have a poor performance in social cohesion. This is the case with New York, Hong Kong and Seoul. On the opposite side of the figure, the upper right, we have less populated cities with a good performance in both dimensions: Reykjavík, Copenhagen, Eindhoven, Taipei, Oslo and Amsterdam, for example. Furthermore, the smaller cities (of fewer than 1 million inhabitants) show a relatively good performance in social cohesion. This is the case with Basel, Bern, Wellington and Linz. In the bottom left quadrant, we find cities with a poor performance in both dimensions, such as Brasília, Cape Town, Santo Domingo and New Delhi, all located in emerging countries.

Figure 11. Technology and Social Cohesion Dimensions

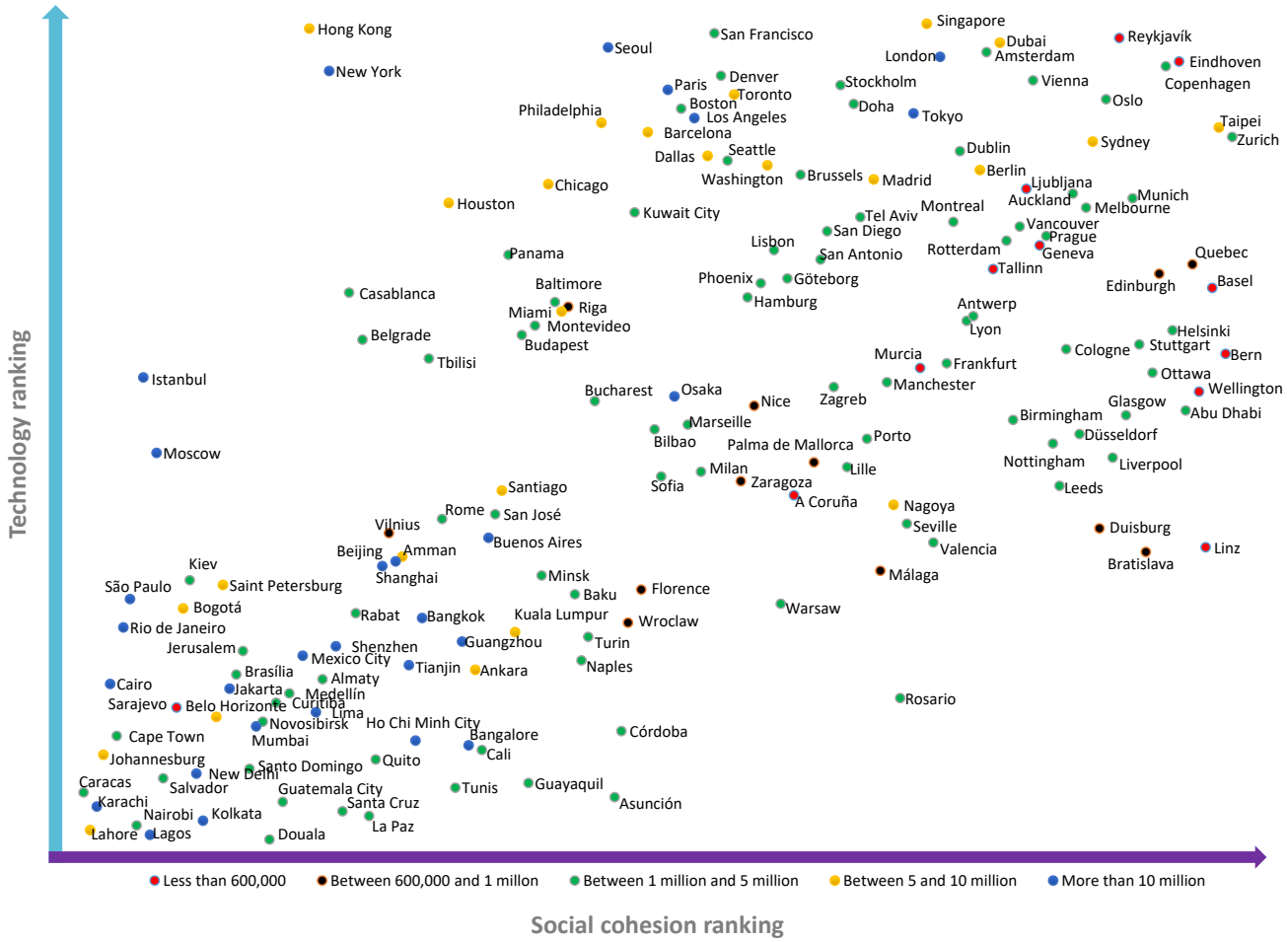


Figure 12 sets out the relationship between the economy and international outreach. Here we observe the following pattern: the cities either perform well in the two dimensions or, on the other hand, perform poorly in both. This allows us to see the relationship between the dimensions, where, in this case, a good performance in the economy could translate into good international outreach or, on the contrary, a bad performance in the economy manifests itself in less international outreach. So, it is not strange to find that, of the cities considered in the index, there are none with a good performance in the economy and a bad one in international outreach. In the opposite case, we find only exceptional examples—such as Buenos Aires and Palma de Mallorca—that do not achieve good positions in the economy but do perform well in international outreach. Among those cities that perform well in both dimensions are the US cities New York, Los Angeles, Chicago and San Francisco; the European cities Paris, London and Amsterdam; and the Asian cities Tokyo, Seoul, Singapore and Hong Kong. The cities with a poor performance in both dimensions, include Tunis, Asunción, Sarajevo and Córdoba.

Figure 12. Economy and International Outreach Dimensions

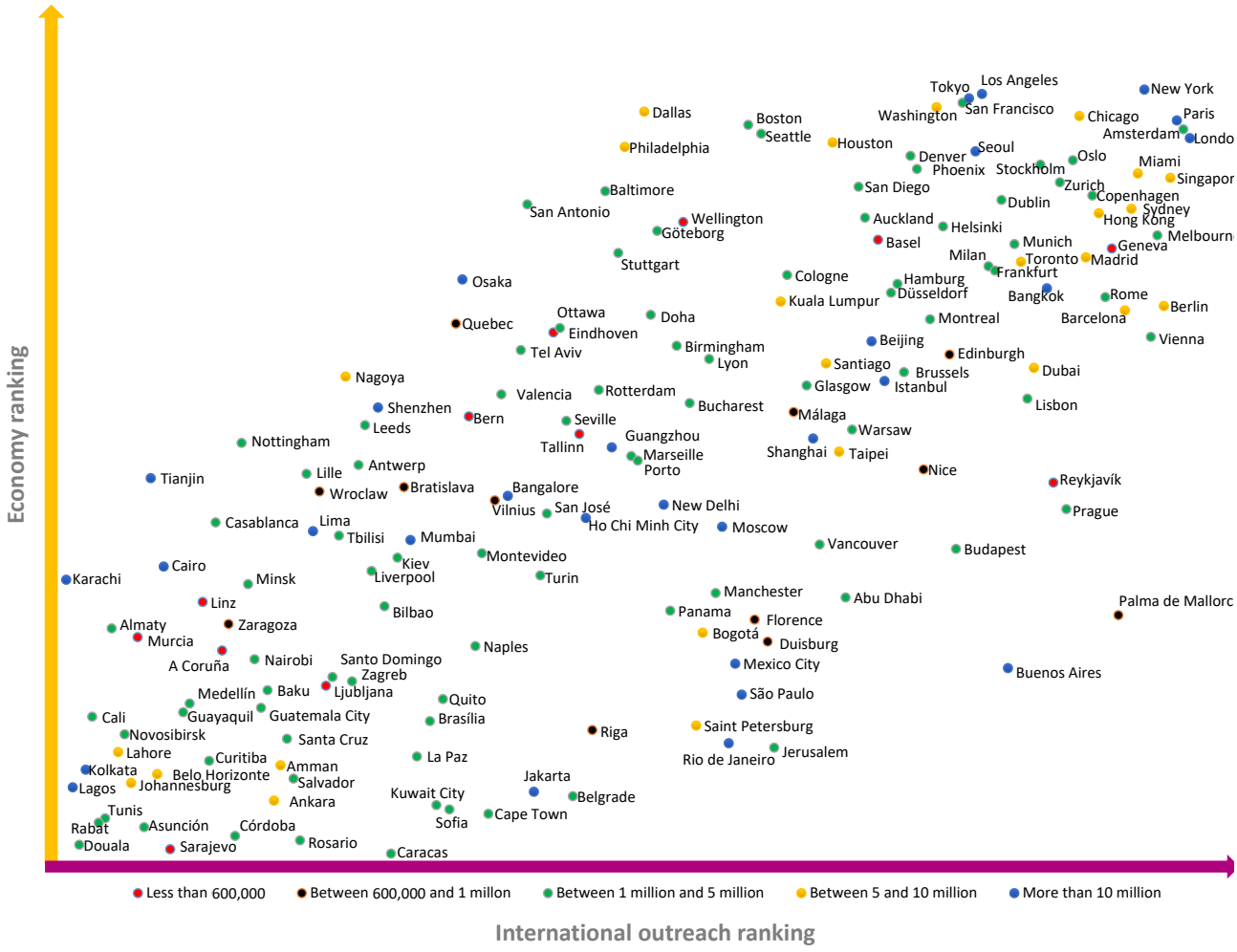
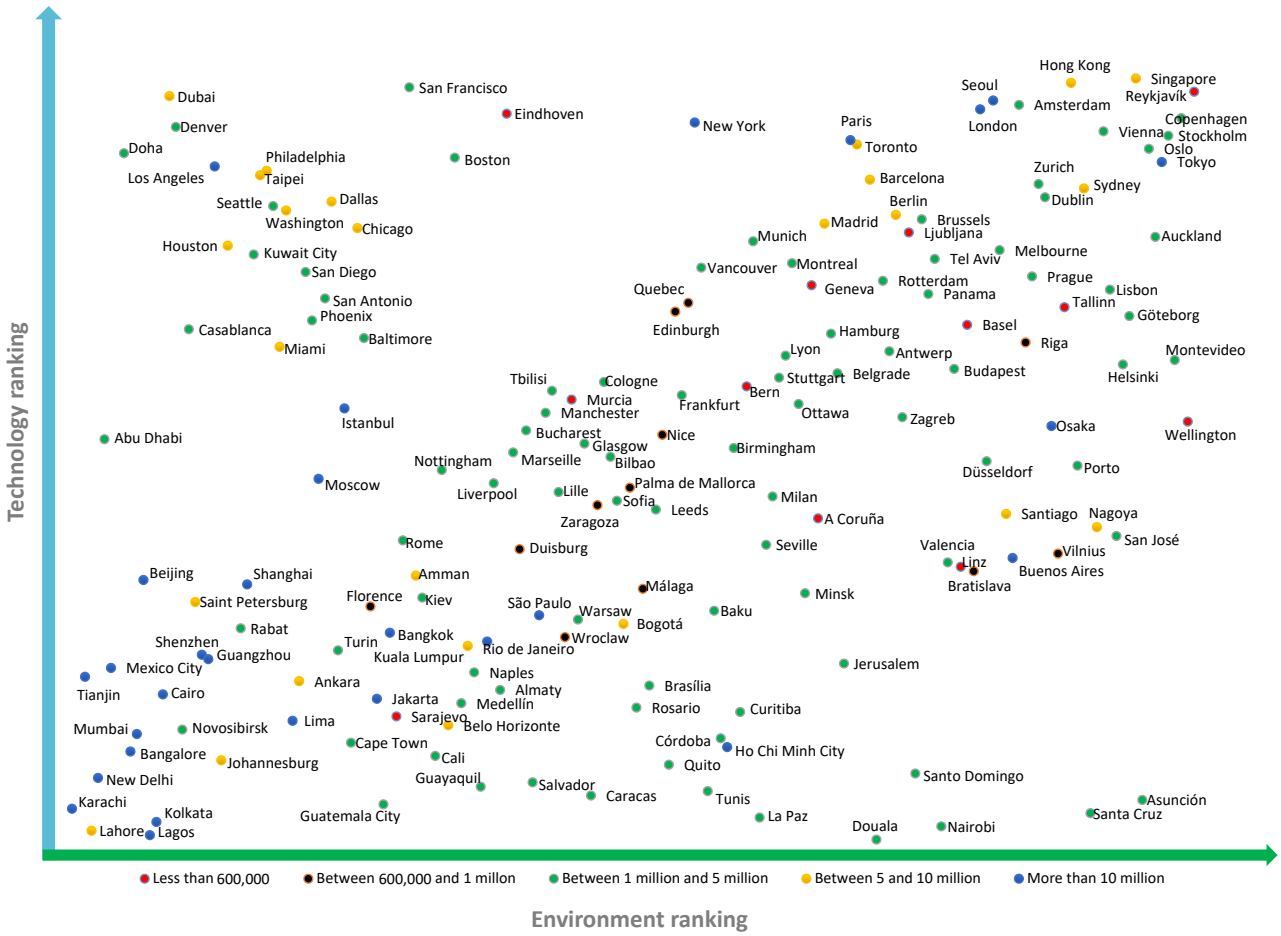


Figure 13 connects the technology and environment dimensions. In the top left quadrant are the cities characterized by a good performance in technology but not in the environment. We can see grouped together US cities such as Philadelphia, Houston, Los Angeles and San Diego and cities in the Middle East such as Dubai and Doha. In the bottom left quadrant are those cities that perform badly in both dimensions. This is the case with Lahore, Lagos, Mexico City and Bangalore. In the top right quadrant, we observe those cities that perform well in both dimensions, with European cities such as London, Copenhagen and Brussels; Canadian cities such as Toronto and Montreal; and cities from Oceania such as Auckland and Melbourne. Finally, in the group of cities that perform badly in technology but do well in the environment, we find South American cities such as Buenos Aires, Santo Domingo, La Paz and Santa Cruz and eastern European such as Minsk and Vilnius.

Figure 13. Technology and Environment Dimensions



Cities in Motion: A Dynamic Analysis

To assess the growth trends and potential of the different cities, we have created a figure that seeks to capture these aspects. Thus, **Figure 14** sets out the current position of each of the cities considered in the **CIMI** (x-axis) and the trend (y-axis). As a measure to calculate the latter value, the change in position experienced between 2016 and 2018 by the cities in this study's ranking has been used. This means that those cities in the top part of the figure have improved in position while those in the bottom part have dropped position. Consequently, in the center are those that have not experienced significant changes in their position in the years analyzed.

The figure's area has been divided into four quadrants according to the type of city: consolidated, challenger, potential, and vulnerable.

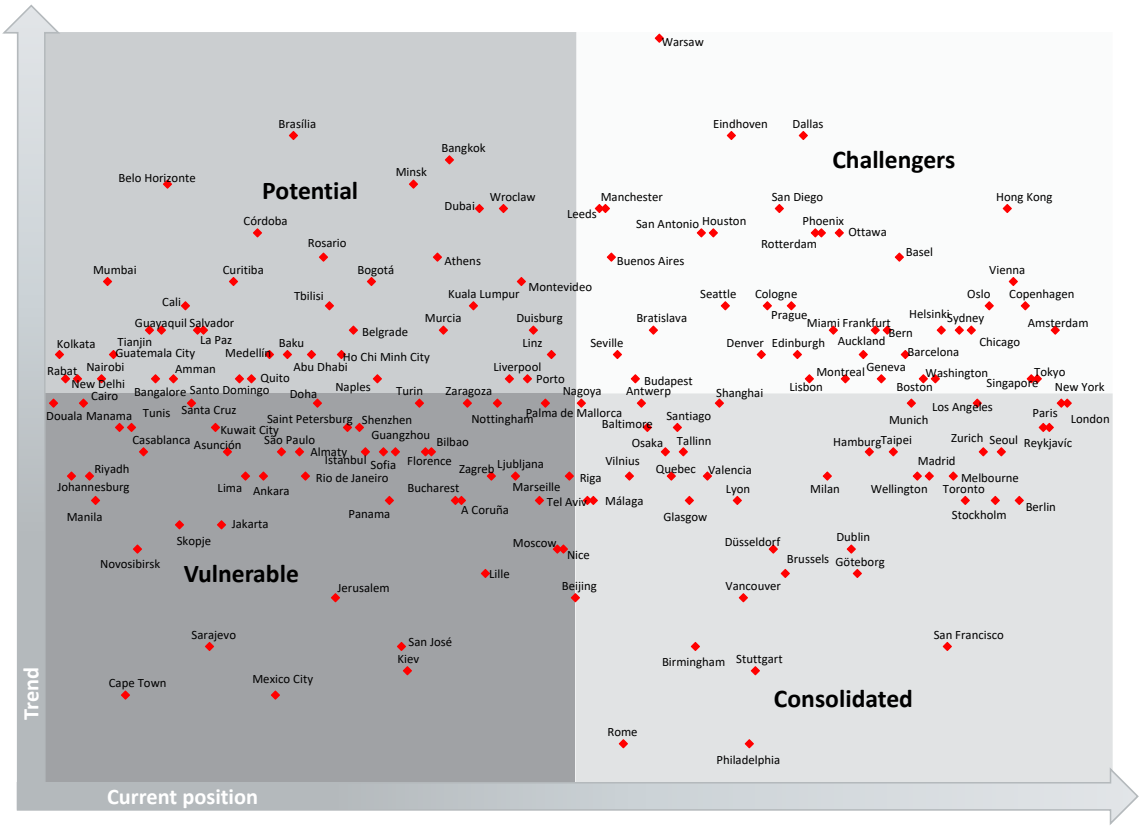
The first group, that of consolidated cities (bottom right quadrant), includes those that, although they have a middle to high overall position, have not experienced any changes throughout the period or have lost a few positions. It is made up of cities from different geographical regions: Philadelphia, Vancouver, San Francisco and Toronto (North America); Berlin, Göteborg, Brussels, Birmingham, Stuttgart, Rome, Stockholm, Madrid, Milan, Lyon, Valencia, Düsseldorf and Glasgow (Europe); Wellington and Melbourne (Oceania); and Taipei (Asia).

The second group, that of challenger cities (top right quadrant), is made up of those that have improved their positions in the index at a fast rate and are already in the middle to high area of the classification. Some examples are Warsaw, Eindhoven, Dallas, Hong Kong, Basel, Ottawa, San Diego, San Antonio, Houston, Buenos Aires, Barcelona, Chicago and Frankfurt.

The third group is made up of those cities that show great potential and that, despite their current position in the middle to low area of the index, are evolving positively at great speed (top left quadrant). They are cities such as Minsk, Dubai, Wrocław, Córdoba, Belo Horizonte and Murcia; Latin American capitals such as Brasília, Bogotá and Montevideo; and Asian cities such as Bangkok and Kuala Lumpur.

The final group includes those that are in a vulnerable position (bottom left quadrant), are growing at a slower pace than the rest and are in the middle to low position of the classification, such as Mexico City, Cape Town and Sarajevo.

Figure 14. Current Position of the Cities in the CIMI and Their Trend



The information presented in the figure is complemented by an analysis of variance of the dimensions concerning the cities. That is, the aim is to understand not only how much they have grown but also how they have done so. To do this, the variation of the different dimensions was calculated for each of the cities that appear in **Figure 15**. Those at the bottom have similar positions in all the fields and therefore show a more homogeneous distribution. However, those at the top stand out in one or several fields while other cities are in a relatively low position. This information, combined with the position of each city, allows us to identify four categories.

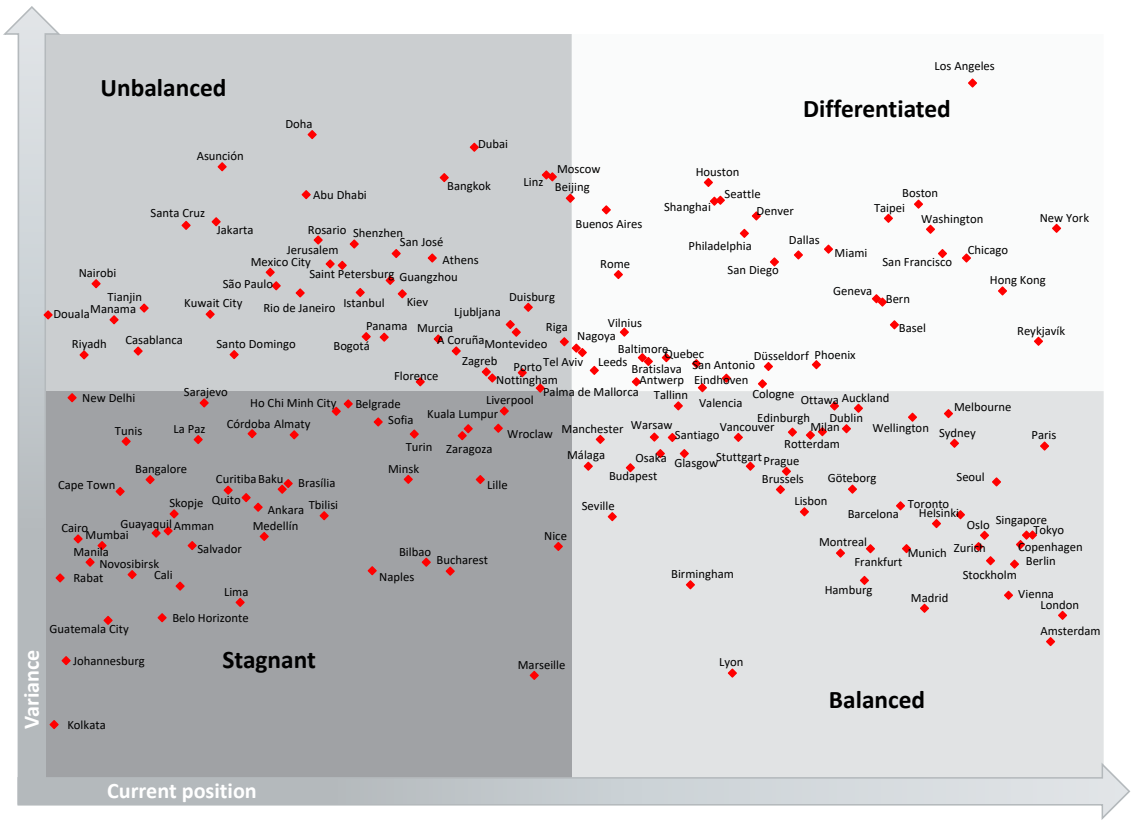
The first of these is made up of "balanced" cities (bottom right quadrant)—that is, those that are in the upper middle part of the table and show relatively high values in all the dimensions. Examples from this category are Stockholm, Madrid, Amsterdam, Birmingham, Montreal, Lyon, Toronto, London, Tokyo, Munich and Vienna.

The second category consists of the "differentiated" cities (top right quadrant)—that is, those that are in high positions in the ranking and get very good results in several dimensions but relatively poor ones in others. An example is New York, which is among the top positions in seven of the nine dimensions but occupies one of the lowest with regard to social cohesion. Another example is Los Angeles, which ranks among the top positions in the economy, human capital and governance but among the lowest with regard to the environment and to mobility and transportation. Likewise, in this category, we find cities such as Geneva, Shanghai, Denver and Boston.

The third quadrant (top left quadrant) corresponds to the so-called "unbalanced" cities—that is, those that are in the bottom positions of the ranking but stand out in one field in particular. are For example, the cities of Doha, Asunción and Shenzhen, which, despite being in worse than position 100 in most of the dimensions, stand out in a particular dimension: Asunción stands out in the environment (position 9), Doha in technology (18) and Shenzhen in mobility and transportation (15). Other cities that are included in this category are Jakarta, Rio de Janeiro, Istanbul, Panama and Rosario.

In the fourth and final quadrant (bottom left quadrant) are the so-called "stagnant" cities, which achieve poor results in almost all the dimensions analyzed. Some examples are Lima, Kolkata, Johannesburg and Naples, which are in worse than position 100 in seven of the nine dimensions.

Figure 15. Variance Between the Cities' Dimensions



Recommendations and Conclusions

The **CIMI** synthetic index makes it possible, through an objective calculation methodology, to compile a ranking of cities taking into account various aspects. The different dimensions analyzed offer a broad and holistic vision of what a city represents, while allowing greater understanding of its composition and its evolution over time.

The results of the index and our experience of using it to assess different cities allow us to make the following recommendations and reach some significant conclusions:

Size matters (although not so much). This new edition of the **CIMI** makes clear that large cities occupy leading positions in the ranking. The first 10 positions are held by megacities such as London, New York, Paris and Tokyo. However, among the top positions some medium-sized cities also stand out such as Amsterdam, Vienna and Copenhagen and even small cities, as in the case of Reykjavík in particular. These results reveal that size is not a prerequisite for achieving top positions in the ranking.

Finding the right balance is a complex (and permanent) process. The report's dynamic analysis shows that only a select number of cities is capable of doing well in all the dimensions. For instance, London, Amsterdam, Seoul and Vienna stand out in this regard. Many struggle to balance their performance across the different fields but lose that battle. For example, when analyzing the relationship between the dimensions of technology and the environment, we can observe how several US cities perform relatively well in the former dimension but fail in the latter. So they could use as benchmarks other cities, such as Singapore, which are able to perform well in both dimensions, and identify practices applicable to their situation. Something similar comes to light when studying the relationship between the economy and social cohesion. It can be observed in this respect that many cities that are capable of reaching high economic levels (in average terms) are, at the same time, more inequitable and unequal. This aspect, which seems prevalent in large cities—such as Hong Kong, New York, Houston and Bangkok—must be managed properly as it can generate tensions and conflict between different strata in society. To do so, it is essential to understand the relationships and interactions between the different dimensions of a city and to identify where the trade-offs are with the aim of looking for creative ways to resolve them. Undoubtedly, one of the great challenges for cities in the 21st century is to transform themselves into urban areas that are simultaneously prosperous, equitable and inclusive. This goal is essentially a permanent, holistic and long-term process.

An all-embracing vision is necessary. Related to the previous point, the **CIMI** makes clear that it is not enough to be good in only one dimension. There are cities at the top of the ranking in some dimensions, such as Asunción, Abu Dhabi, Moscow and Kiev, which do relatively well in the environment, social cohesion, human capital and urban planning respectively but, in the overall classification, are located in positions 141, 127, 86 and 111, again respectively. These cities—called "unbalanced" in the analysis of variance—are recommended to be capable of reaching acceptable minimums in the dimensions as a whole if they seek to play in the big leagues. This message must also reach those cities that understand technology to be the main (or only) ingredient of a smart city and do not take into account other critical fields that define the urban situation. If a city does not see the whole picture, it will be difficult for it to become a smart city.

A long-term vision is necessary. Cities need to define their identity and establish a strategic plan. One of the most important (and difficult) questions that must be asked is what kind of city they want in the future. The answer will not only define their identity but also set out the path of transformation that they must travel to achieve it. That is, they must consider what their strategic plan will be. In fact, a sound strategic plan will prevent changes that may veer the city away from its identity as circumstances or governments change, and the plan must be unique and individual for each city. This means that local governments must escape from the one-size-fits-all approach and define a specific long-term vision for their city. The **CIMI** makes clear that there is no single model of success.

Strategic priorities must be established. In relation to the previous point, the **CIMI** shows that the cities that top the ranking are not only not identical but they prioritize various dimensions. (See **Appendix 2**.) Moreover, there are several paths to get to the top of the index. Establishing and defining strategic priorities whose goal is to achieve the long-term vision defined in

the strategic plan mentioned previously will strengthen the city's capacity for organization and action, as well as its ability to achieve those goals successfully.

The first step is a good diagnosis. One of the first activities that must be carried out in any strategic definition is to understand where we are. In this regard, the **CIMI** can be used as a diagnostic tool to do a first assessment of the current status of the city in the different dimensions of our model. Likewise, it allows a quick X-ray to be taken of the cities to identify their strengths and point out where there may be room for improvement.

The benchmark is the beginning of change. The ability to compare 174 cities across nine different dimensions helps us to identify those that perform best in the different urban aspects. In this sense, cities that are lagging behind or stagnant in one or more dimensions can study the best in each category with the aim of identifying the practices that will improve their performance. This comparison will allow cities to start moving in the right direction. That said, it must be borne in mind that, while the challenges facing cities are global, their effects are local. Therefore, the benchmark should serve as a source of inspiration rather than as a road map for action. In this regard, at IESE Cities in Motion, we have published a series of books—available on Amazon—that identify good practices across the different dimensions and we invite the public to read them.

The CIMI is not a "beauty contest." It has surprised us to see how many cities included in the index are more concerned about their position in the ranking than the analysis that can be derived from it. Our perspective is that the value of the **CIMI** lies not only in its ability to detect strengths and weaknesses but also in its temporal component, which makes it possible to identify where each city is heading toward. In this regard, our recommendation to urban managers is that they pay more attention to the trend (dynamic analysis) than to the position.

Collaboration is the cornerstone of success. Our experience from IESE Cities in Motion and the associated platform PPP for Cities (www.pppcities.org) tells us that the cities that do best in the ranking understand fully that the challenges facing them are too big to be tackled individually. Collaboration is needed between different social partners—public, private, educational institutions, or nonprofit organizations—and, although it can adopt various formats (from public-private partnerships to collaborative economy structures), it is essential for achieving long-term success. Ideas of collaboration and cooperation should be extended within city councils themselves, where there are often "silos" that prevent people from seeing the relationships and the possible synergies among the different dimensions of our conceptual model. Finally, we ask that cities collaborate with each other, especially those that, in addition to being in proximity, share infrastructures and services. In this way, they will achieve more efficient urban systems.

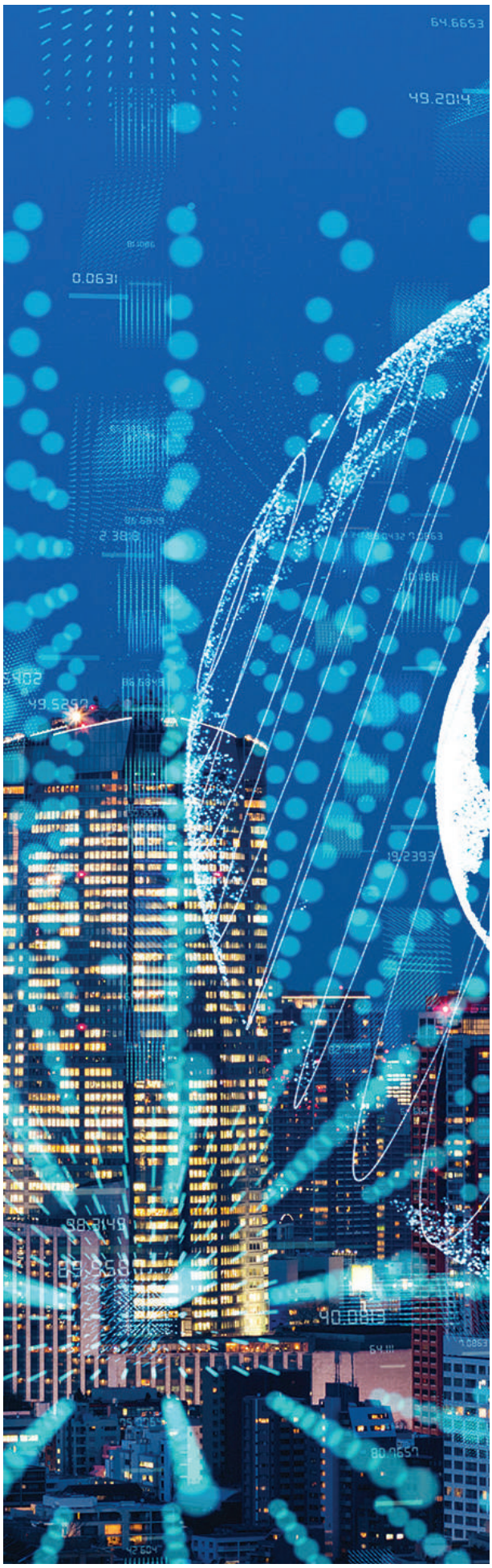
The participation of the public must be a tool for transformation. In addition, the collaboration mentioned in the previous point must be fluid between residents and the administration because, otherwise, any solutions adopted will not be efficient when it comes to responding to society's real needs. More and more cities are becoming aware of the importance of involving the public in the processes of transforming and managing them, as reflected in the proliferation of initiatives such as participatory budgets and digital participation platforms, where members of the public can give their opinions, make suggestions and, in short, have a voice in the definition and execution of strategic plans.

There are many good cities but the perfect city does not exist. It is very difficult for a single city to maximize all the dimensions. Even those cities in the top positions of the rankings have weak points. Cities such as New York and Los Angeles have a long way to go with regard to social cohesion and the environment. Therefore, they have been classified as "differentiated" and so we recommend that they make the most of the advantages they have in the fields in which they are leaders in order to progress in the positions where they are lagging behind more. For example, a city can make the most of its technological leadership to improve its results in terms of the environment. In addition, for the cities that we have classified as "balanced," the main recommendation is that they should not rest on their laurels. Despite their more harmonious growth, they still have room for improvement.

Change is slow for most of the cities. While our temporal analysis of the **CIMI** indicates that some cities are capable of making great advances in a relatively short time and of moving to higher positions quickly (Oslo, Dallas, San Diego and Frankfurt, for example), in general it shows us that, in most cases, cities' positions in the ranking have not changed significantly from one year to the next. This is due, to a large extent, to the time that projects of any magnitude need to crystallize. Therefore, when seeking to generate changes needed to become smart and sustainable, cities should adopt long-term policies as soon as possible—especially the worst-placed cities, which we have called "stagnant" in our analysis. There are many cities that still have problems when it comes to dealing with the major challenges, including the lack of collaboration between public and private bodies and between civic institutions and the public; the impossibility of promoting new business models that could provide financing for new businesses; and a shortsighted vision of smart cities.

The urbanization process is one of the most significant challenges of the 21st century. As the world population moves toward cities, existing problems grow and new ones are generated that, in turn, are influenced profoundly by the globalization process. This trend means a closer relationship between global dynamics and cities, which generates local impacts: effects on the economy and demographics, social divisions or environmental impacts.

Despite these challenges, cities and their leaders should understand the positive aspect that these generate. From our perspective, the city offers a much more delimited sphere of action, which enables work to be done more directly for people's benefit. However, urban managers must take a step back and analyze their problems, try to discover what other cities do, and learn what good practices are being carried out elsewhere in the world. Day-to-day management makes it difficult for cities to ask themselves how to promote the positive effects of the urbanization process and reduce the negative ones. For this reason, from the IESE Cities in Motion platform, we want to create awareness and generate innovative tools with the goal of achieving smarter governments. With this index, we hope to have contributed to this aim.



Appendix 1. Indicators

No.	Indicator	Description / Unit of measurement	Dimension	Source
1	Higher education	Proportion of population with secondary and higher education.	Human capital	Euromonitor
2	Business schools	Number of business schools (top 100).	Human capital	*Financial Times*
3	Movement of students	International movement of higher-level students. Number of students.	Human capital	UNESCO
4	Universities	Number of universities in the city that are in the top 500.	Human capital	QS Top Universities
5	Museums and art galleries	Number of museums and art galleries per city.	Human capital	OpenStreetMap
6	Schools	Number of public or private schools per city.	Human capital	OpenStreetMap
7	Theaters	Number of theaters per city.	Human capital	OpenStreetMap
8	Expenditure on leisure and recreation	Expenditure on leisure and recreation per capita.	Human capital	Euromonitor
9	Expenditure on leisure and recreation	Expenditure on leisure and recreation. In millions of dollars, according to 2016 prices.	Human capital	Euromonitor
10	Expenditure on education	Expenditure on education per capita.	Human capital	Euromonitor
11	Mortality	Ratio of deaths per 100,000 inhabitants.	Social cohesion	Euromonitor
12	Crime rate	Crime rate.	Social cohesion	Numbeo
13	Health	Health index.	Social cohesion	Numbeo
14	Unemployment	Unemployment rate (number of unemployed out of the workforce).	Social cohesion	Euromonitor
15	Gini index	Measure of social inequality. It varies from 0 to 100, with 0 being a situation of perfect equality and 100 that of perfect inequality.	Social cohesion	Euromonitor
16	Price of property	Price of property as percentage of income.	Social cohesion	Numbeo
17	Female workers	Ratio of female workers in the public administration.	Social cohesion	International Labour Organization (ILO)
18	Global Peace Index	An index that measures the peacefulness and the absence of violence in a country or region. The bottom-ranking positions correspond to countries with a high level of violence.	Social cohesion	Institute for Economics and Peace
19	Hospitals	Numbers of public and private hospitals and health centers per city.	Social cohesion	OpenStreetMap
20	Happiness index	An index that measures the level of happiness of a country. The highest values correspond to countries that have a higher degree of overall happiness.	Social cohesion	World Happiness Index

No.	Indicator	Description / Unit of measurement	Dimension	Source
21	Global Slavery Index	Ranking that considers the proportion of people in a situation of slavery in the country. The countries occupying the top positions in the ranking are those with the highest proportion.	Social cohesion	Walk Free Foundation
22	Government response to situations of slavery	This variable measures how the government deals with situations of slavery in the country. The top positions in the ranking indicate countries that have a more effective and comprehensive response.	Social cohesion	Walk Free Foundation
23	Terrorism	Number of terrorist incidents by city in the previous three years.	Social cohesion	Global Terrorism Database (GTD) of the University of Maryland
24	Female-friendly	The variable seeks to measure whether a city provides a friendly environment for women on a scale of 1 to 5. Cities with a value of 1 have a more hostile environment, while those that have a value of 5 are very friendly.	Social cohesion	Nomad List
25	Suicides	Suicide rate by city.	Social cohesion	Nomad List
26	Homicides	Homicide rate by city.	Social cohesion	Nomad List
27	Productivity	Labor productivity calculated as GDP per working population (in thousands).	Economy	Euromonitor
28	Time required to start a business	Number of calendar days needed so a business can operate legally.	Economy	World Bank
29	Ease of starting a business	The top positions in the ranking indicate a more favorable regulatory environment for creating and developing a local company.	Economy	World Bank
30	Headquarters	Number of headquarters of publicly traded companies.	Economy	Globalization and World Cities (GaWC)
31	Motivation to get started in TEA (total early-stage entrepreneurial activity)	Percentage of people involved in TEA (that is, novice entrepreneurs and owners or managers of a new business), driven by an opportunity for improvement, divided by the percentage of TEA motivated by need.	Economy	Global Entrepreneurship Monitor (GEM)
32	GDP estimate	Estimated annual GDP growth.	Economy	Euromonitor
33	GDP	GDP in millions of dollars at 2016 prices.	Economy	Euromonitor
34	GDP per capita	GDP per capita at 2016 prices.	Economy	Euromonitor
35	Mortgage	Mortgage as a percentage of income. It is calculated as a proportion of the real monthly cost of the mortgage with respect to the family income (estimated via the average monthly salary). The lower the percentage, the better.	Economy	Numbeo

No.	Indicator	Description / Unit of measurement	Dimension	Source
36	Glovo	The variable assumes the value of 1 if the city has the Glovo service and 0 otherwise.	Economy	Glovo
37	Uber	The variable assumes the value of 1 if the city has the Uber service and 0 otherwise.	Economy	Uber
38	Salary	Hourly wage in the city.	Economy	Euromonitor
39	Purchasing power	Purchasing power (determined by the average salary) for the purchase of goods and services in the city, compared with the purchasing power in New York City.	Economy	Numbeo
40	Reserves	Total reserves in millions of current dollars. Estimate at urban level according to the population.	Governance	World Bank
41	Reserves per capita	Reserves per capita in millions of current dollars.	Governance	World Bank
42	Embassies	Number of embassies and consulates per city.	Governance	OpenStreetMap
43	ISO 37120 certification	This establishes whether or not the city has ISO 37120 certification. Certified cities are committed to improving their services and quality of life. It is a variable coded from 0 to 6. Cities that have been certified for the longest time have the highest value. The value 0 is for those cities without certification.	Governance	World Council on City Data (WCCD)
44	Research centers	Number of research and technology centers per city.	Governance	OpenStreetMap
45	Government buildings	Number of government buildings and premises in the city.	Governance	OpenStreetMap
46	Strength of legal rights index	The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate access to loans. The values go from 0 (low) to 12 (high), where the highest ratings indicate that the laws are better designed to expand access to credit.	Governance	World Bank
47	Corruption perceptions index	Countries with values close to 0 are perceived as very corrupt and those with an index close to 100 as very transparent.	Governance	Transparency International
48	Open data platform	This describes whether the city has an open data system.	Governance	CTIC Foundation and Open World Bank
49	E-Government Development Index (EGDI)	The EGDI reflects how a country uses information technology to promote access and inclusion for its citizens.	Governance	United Nations
50	Democracy ranking	Ranking where the countries in the highest positions are those considered more democratic.	Governance	*The Economist* Intelligence Unit

No.	Indicator	Description / Unit of measurement	Dimension	Source
51	Employment in the public administration	Percentage of population employed in public administration and defense; education; health; community, social and personal service activities; and other activities.	Governance	Euromonitor
52	CO_2 emissions	CO_2 emissions from the burning of fossil fuels and the manufacture of cement. Measured in kilotons (kt).	The environment	World Bank
53	CO_2 emission index	CO_2 emission index.	The environment	Numbeo
54	Methane emissions	Methane emissions that arise from human activities such as agriculture and the industrial production of methane. Measured in kt of CO_2 equivalent.	The environment	World Bank
55	Access to the water supply	Percentage of the population with reasonable access to an appropriate quantity of water resulting from an improvement in the supply.	The environment	World Bank
56	PM2.5	The indicator PM2.5 measures the number of particles in the air whose diameter is less than 2.5 micrometers (µm). Annual mean.	The environment	World Health Organization (WHO)
57	PM10	The indicator PM10 measures the amount of particles in the air whose diameter is less than 10 µm. Annual mean.	The environment	WHO
58	Pollution	Pollution index.	The environment	Numbeo
59	Environmental Performance Index (EPI)	This measures environmental health and ecosystem vitality. Scale from 1 (poor) to 100 (good).	The environment	Yale University
60	Renewable water resources	Total renewable water sources per capita.	The environment	Food and Agriculture Organization of the United Nations (FAO)
61	Future climate	Percentage of the rise in temperature in the city during the summer forecast for 2100 if pollution caused by carbon emissions continues to increase.	The environment	Climate Central
62	Solid waste	Average amount of municipal solid waste (garbage) generated annually per person (kg/year).	The environment	Waste Management for Everyone
63	Traffic index	Consideration of the time spent in traffic, the dissatisfaction this generates, CO_2 consumption and other inefficiencies of the traffic system.	Mobility and transportation	Numbeo
64	Inefficiency index	Estimation of traffic inefficiencies (such as long journey times). High values represent high rates of inefficiency in driving.	Mobility and transportation	Numbeo
65	Index of traffic for commuting to work	Index of time that takes into account how many minutes it takes to commute to work.	Mobility and transportation	Numbeo
66	Bike sharing	This system shows the automated services for the public use of shared bicycles that provide transport from one location to another within a city. The indicator varies between 0 and 8 according to how developed the system is.	Mobility and transportation	Bike-Sharing World Map

No.	Indicator	Description / Unit of measurement	Dimension	Source
67	Length of the metro system	Length of the metro system per city.	Mobility and transportation	Metrobits
68	Metro stations	Number of metro stations per city.	Mobility and transportation	Metrobits
69	Flights	Number of arrival flights (air routes) in a city.	Mobility and transportation	OpenFlights
70	High-speed train	Binary variable that shows whether the city has a high-speed train or not.	Mobility and transportation	OpenRailwayMap
71	Vehicles	Number of commercial vehicles in the city (in thousands).	Mobility and transportation	Euromonitor
72	Bicycles per household	Percentage of bicycles per household.	Mobility and transportation	Euromonitor
73	Bicycles for rent	Number of bike-rental or bike-sharing points, based on docking stations where they can be picked up or dropped off.	Urban planning	OpenStreetMap
74	Percentage of the urban population with adequate sanitation facilities	Percentage of the urban population that uses at least basic sanitation services—that is, improved sanitation facilities that are not shared with other households.	Urban planning	World Bank
75	Number of people per household	Number of people per household. Occupancy by household is measured compared to the average. This makes it possible to estimate if a city has overoccupied or underoccupied households.	Urban planning	Euromonitor
76	High-rise buildings	Percentage of buildings considered high-rises. A high-rise is a building of at least 12 stories or 35 meters (115 feet) high.	Urban planning	Skyscraper Source Media
77	Buildings	This variable is the number of completed buildings in the city. It includes structures such as high-rises, towers and low-rise buildings but excludes other various others, as well as buildings in different states of completion (in construction, planned, etc.).	Urban planning	Skyscraper Source Media
78	McDonald's	Number of McDonald's chain restaurants per city.	International outreach	OpenStreetMap
79	Number of passengers per airport	Number of passengers per airport in thousands.	International outreach	Euromonitor
80	Sightsmap	Ranking of cities according to the number of photos taken there and uploaded to Panoramio (community where photographs were shared online). The top positions correspond to the cities with the most photographs.	International outreach	Sightsmap

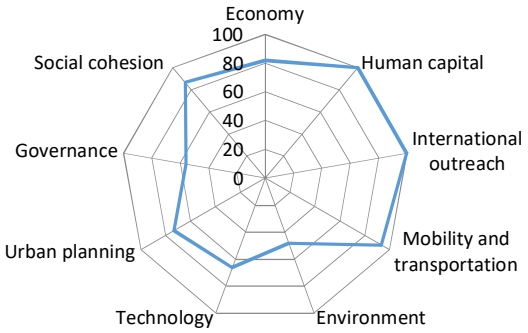
No.	Indicator	Description / Unit of measurement	Dimension	Source
81	Number of conferences and meetings	Number of international conferences and meetings that are held in a city.	International outreach	International Congress and Convention Association (ICCA)
82	Hotels	Number of hotels per capita.	International outreach	OpenStreetMap
83	Restaurant index	The index shows the prices of food and beverages in restaurants and bars compared to New York City.	International outreach	Numbeo
84	Twitter	Registered Twitter users in the city. This is part of the social media variable.	Technology	Tweepsmap
85	LinkedIn	Number of users in the city. This is part of the social media variable.	Technology	LinkedIn
86	Mobile phones	Number of mobile phones in the city via estimates based on country-level data.	Technology	International Telecommunication Union
87	Wi-Fi hot spot	Number of wireless access points globally. These represent the options in the city for connecting to the Internet.	Technology	WiFi Map app
88	Innovation cities index	Innovation index of the city. Valuation of 0 (no innovation) to 60 (a lot of innovation).	Technology	Innovation Cities Program
89	Landline subscriptions	Number of landline subscriptions per 100 inhabitants.	Technology	International Telecommunication Union
90	Broadband subscriptions	Broadband subscriptions per 100 inhabitants.	Technology	International Telecommunication Union
91	Internet	Percentage of households with access to the Internet in the city.	Technology	Euromonitor
92	Mobile telephony	Percentage of households with mobile phones in the city.	Technology	Euromonitor
93	Web Index	The Web Index seeks to measure the economic, social and political benefit that countries obtain from the Internet.	Technology	World Wide Web Foundation
94	Telephony	Percentage of households with some kind of telephone service.	Technology	Euromonitor
95	Internet speed	Internet speed in the city.	Technology	Nomad List
96	Computers	Percentage of households with a personal computer in the city.	Technology	Euromonitor

No.	Indicator	Description / Unit of measurement	Dimension	Source
97	Disposable income	Disposable income (annual average). Decile 1. In dollars.	City cluster	Euromonitor
98	Disposable income	Disposable income (annual average). Decile 2. In dollars.	City cluster	Euromonitor
99	Disposable income	Disposable income (annual average). Decile 5. In dollars.	City cluster	Euromonitor
100	Disposable income	Disposable income (annual average). Decile 7. In dollars.	City cluster	Euromonitor
101	Disposable income	Disposable income (annual average). Decile 9. In dollars.	City cluster	Euromonitor
102	Population	Number of inhabitants.	City/country cluster	Euromonitor
103	Percentage of population employed	Percentage of population employed.	Country cluster	Euromonitor
104	Expenditure on medical and health services	Expenditure on medical and health services per inhabitant. In millions of dollars, according to 2016 prices.	Country cluster	Euromonitor
105	Expenditure on hospitality and catering	Expenditure on hospitality and catering services per inhabitant. In millions of dollars, according to 2016 prices.	Country cluster	Euromonitor
106	Expenditure on housing per inhabitant	Expenditure on housing per inhabitant. In millions of dollars, according to 2016 prices.	Country cluster	Euromonitor

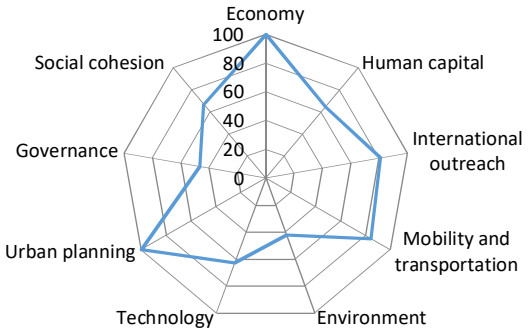
Appendix 2. Graphical Analysis of the Profiles of the 174 Cities

Below is a graphical analysis of the 174 cities included in the **CIMI**, based on the nine key dimensions. These radar charts, arranged according to ranking, aim to facilitate interpretation of each city's profile by identifying the values of the various fields and, at the same time, they enable comparisons of two or more cities at a glance.

 # 1 - London - United Kingdom



 # 2 - New York - USA



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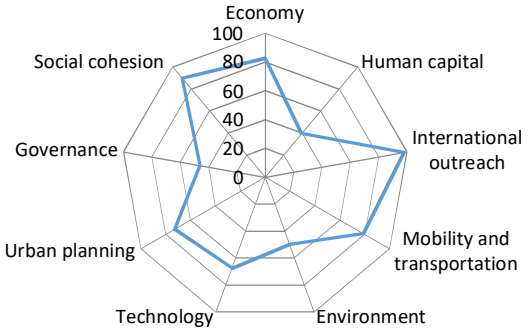
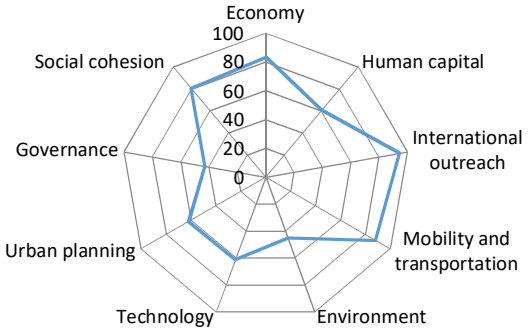
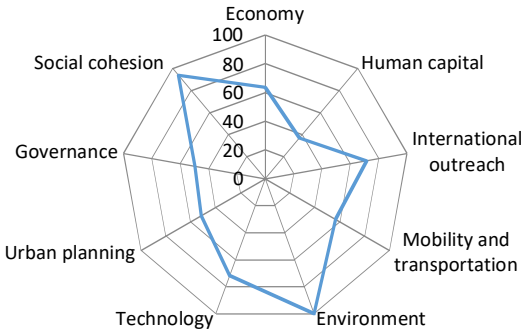


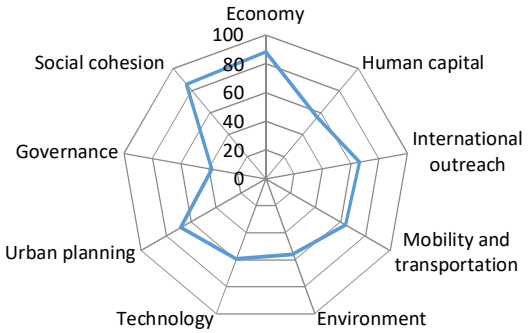
 # 4 - Paris - France

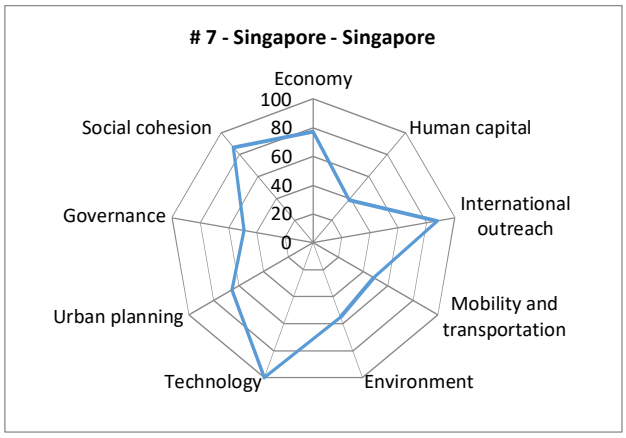


 # 5 - Reykjavík - Iceland



 # 6 - Tokyo - Japan




7 - Singapore - Singapore
Economy
100
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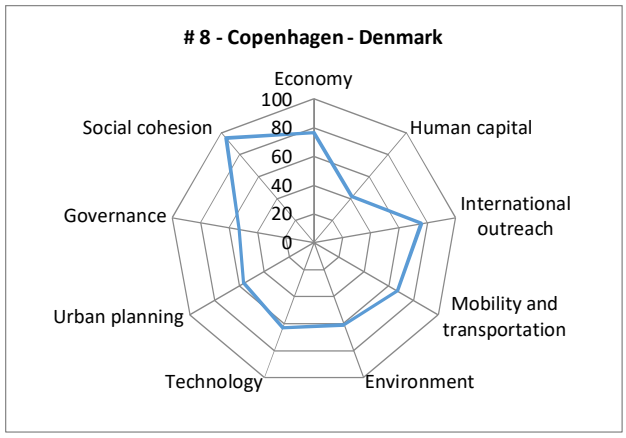
0
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion


8 - Copenhagen - Denmark
Economy
100
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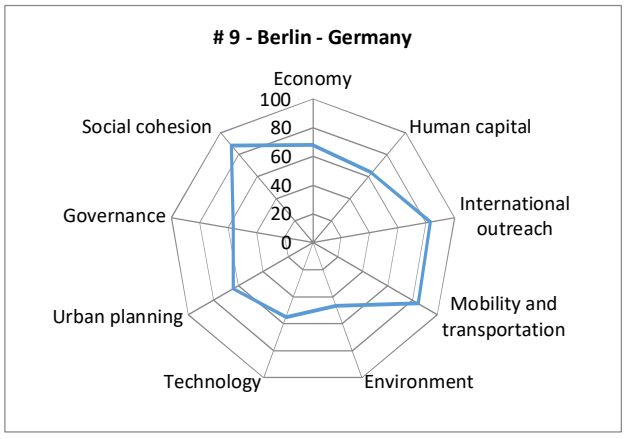
0
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion


9 - Berlin - Germany
Economy
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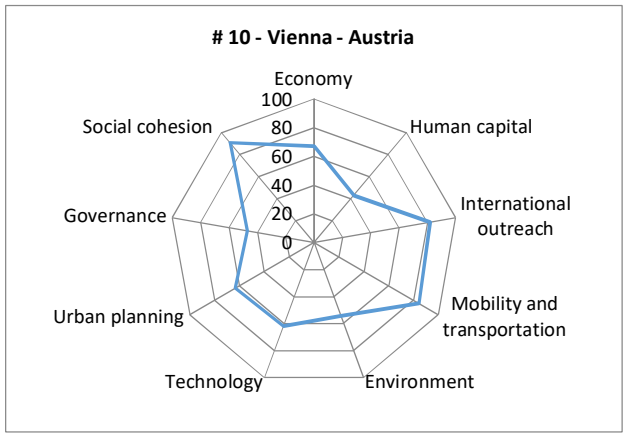
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion


10 - Vienna - Austria
Economy
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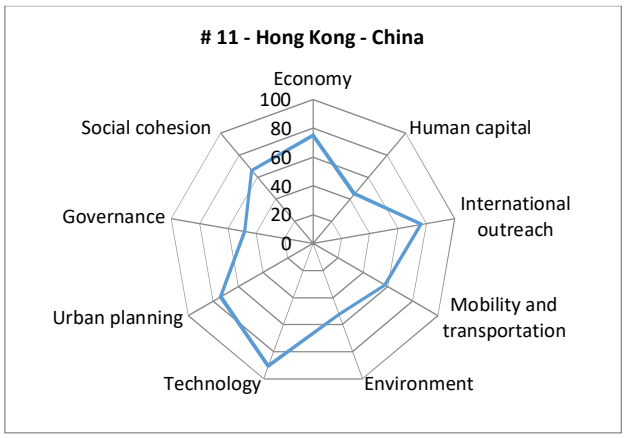
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion


11 - Hong Kong - China
Economy
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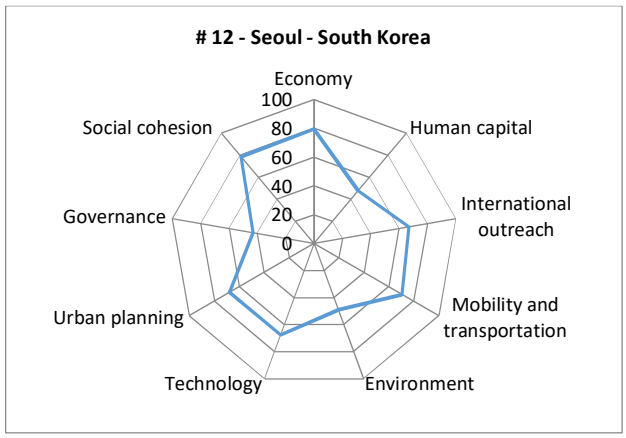
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion


12 - Seoul - South Korea
Economy
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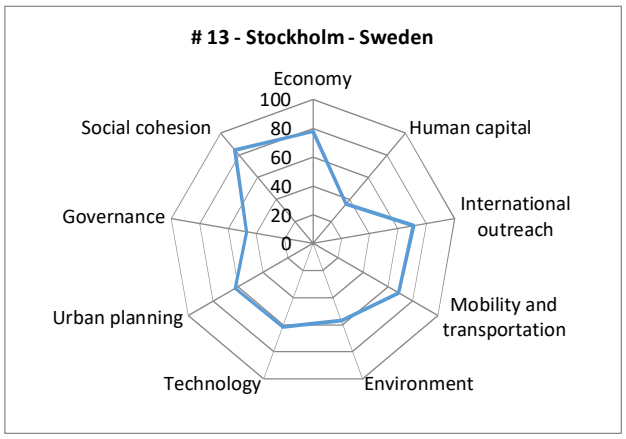
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion


13 - Stockholm - Sweden
Economy
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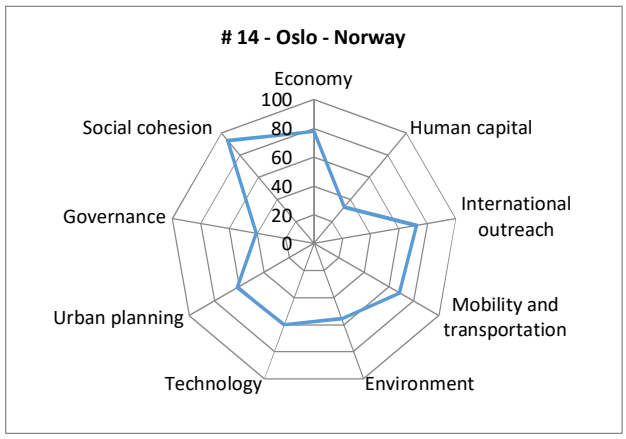
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion


14 - Oslo - Norway
Economy
100
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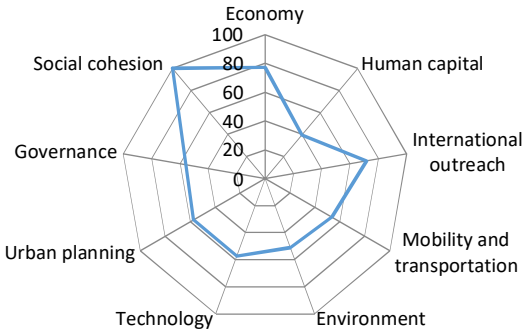
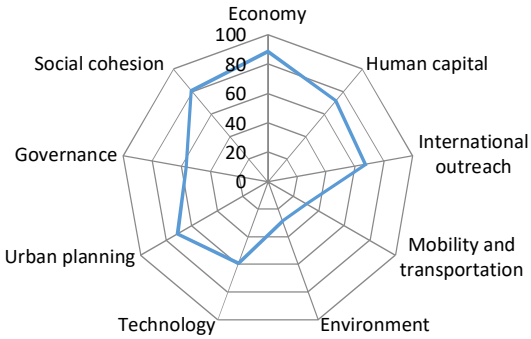
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion

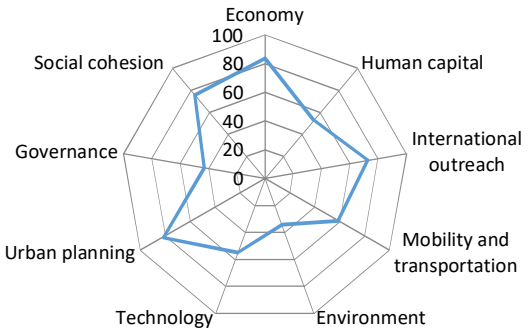
 # 15 - Zurich - Switzerland



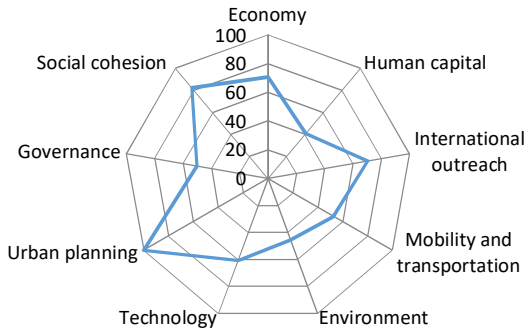
 # 16 - Los Angeles - USA



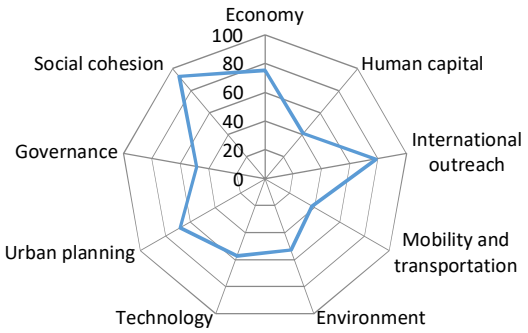
 # 17 - Chicago - USA



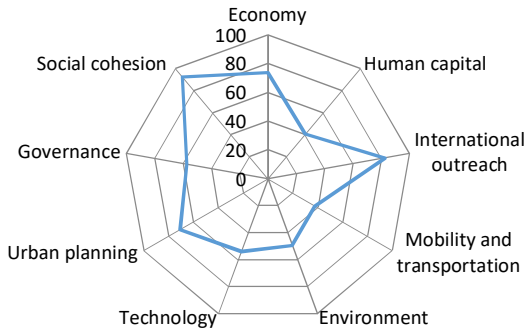
 # 18 - Toronto - Canada



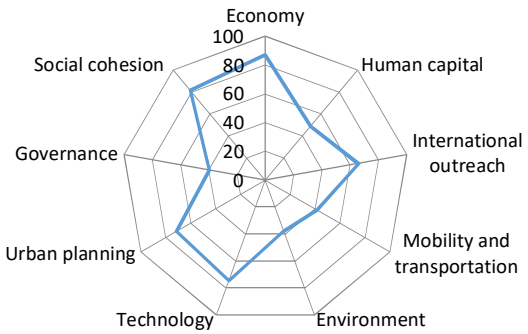
 # 19 - Sydney - Australia



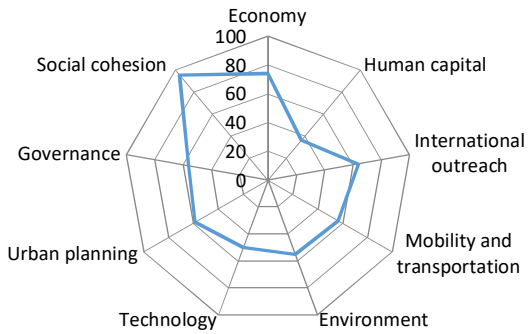
 # 20 - Melbourne - Australia

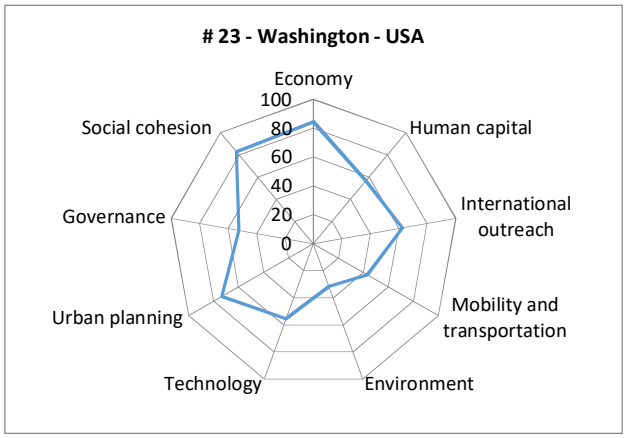


 # 21 - San Francisco - USA



 # 22 - Helsinki - Finland




23 - Washington - USA
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
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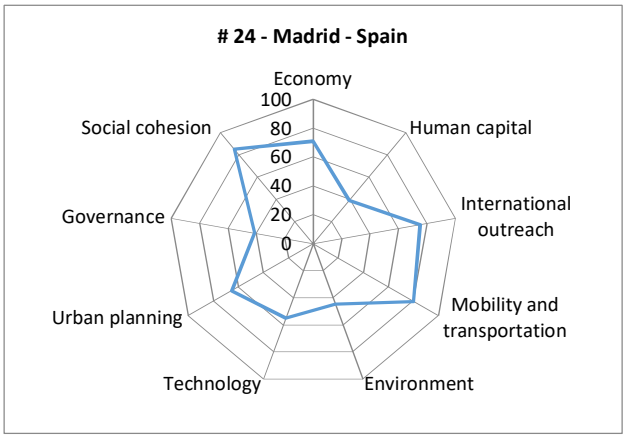
20
0


24 - Madrid - Spain
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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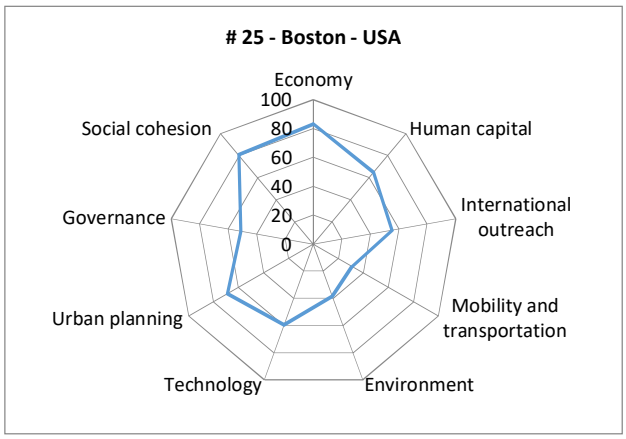
0


25 - Boston - USA
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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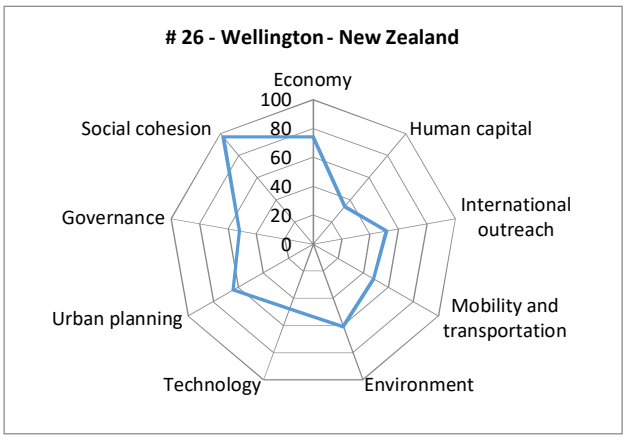
0


26 - Wellington - New Zealand
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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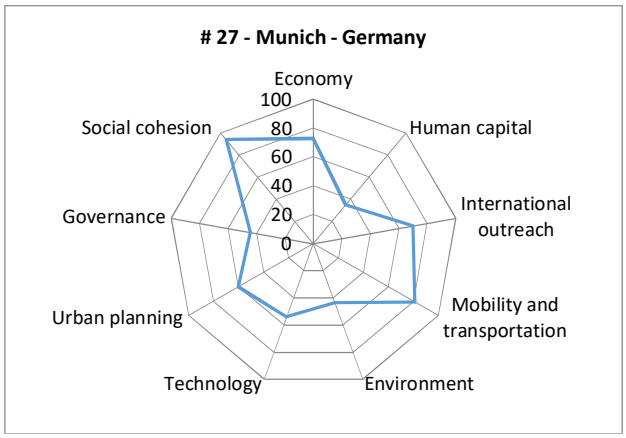
27 - Munich - Germany
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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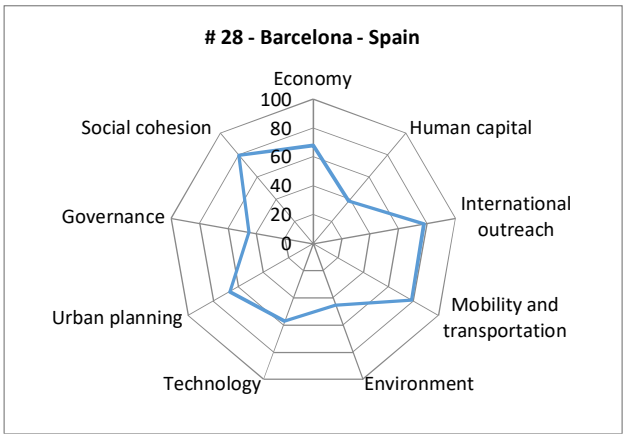
28 - Barcelona - Spain
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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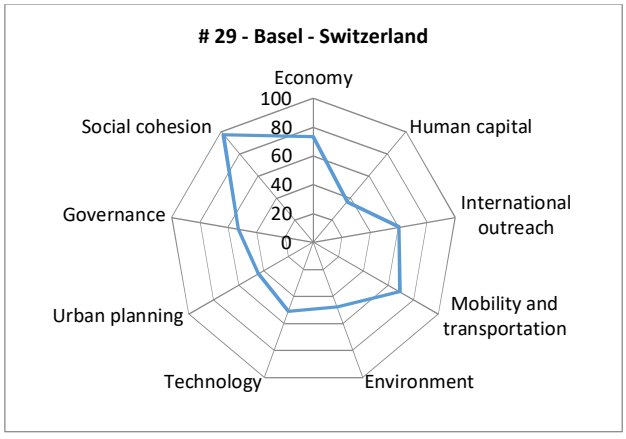
29 - Basel - Switzerland
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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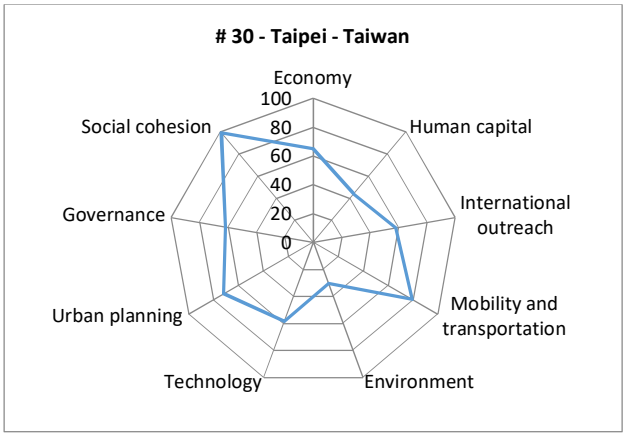
30 - Taipei - Taiwan
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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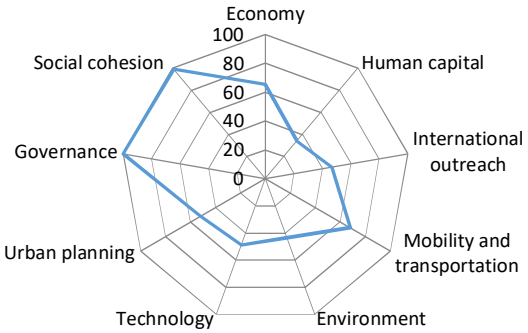
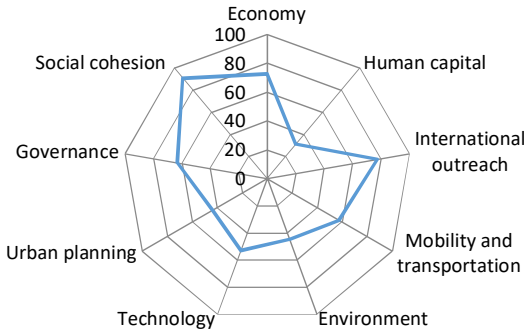
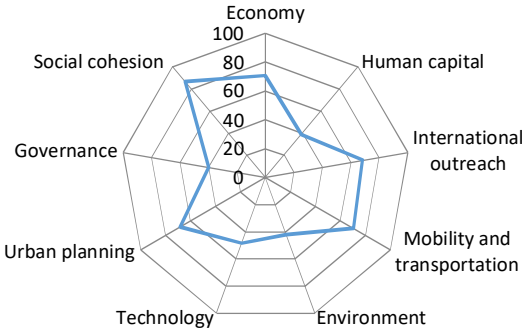
 # 31 - Bern - Switzerland



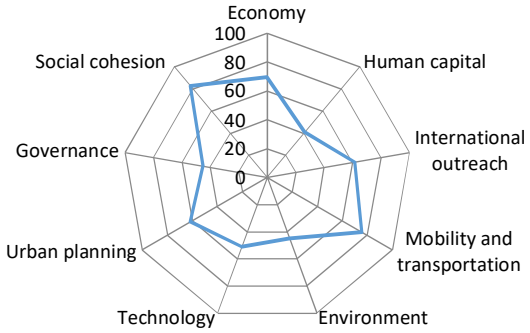
 # 32 - Geneva - Switzerland



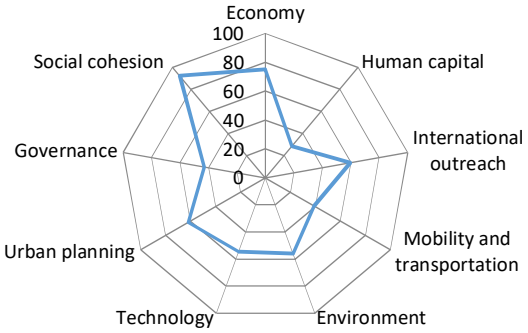
 # 33 - Frankfurt - Germany



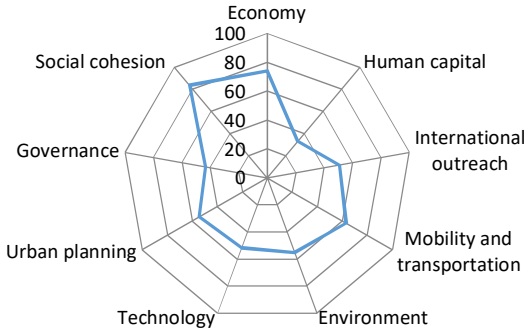
 # 34 - Hamburg - Germany



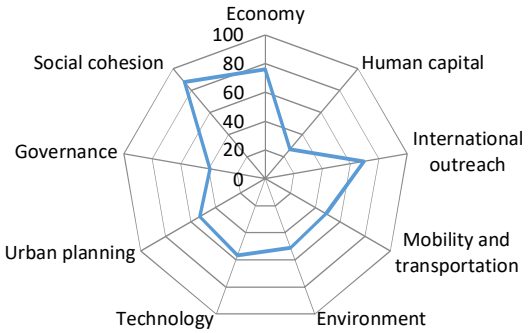
 # 35 - Auckland - New Zealand



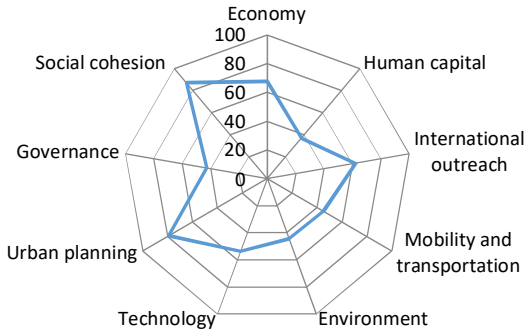
 # 36 - Göteborg - Sweden

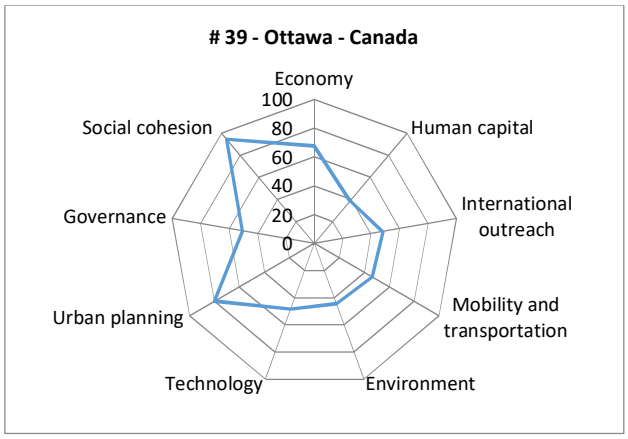


 # 37 - Dublin - Ireland



 # 38 - Montreal - Canada




39 - Ottawa - Canada
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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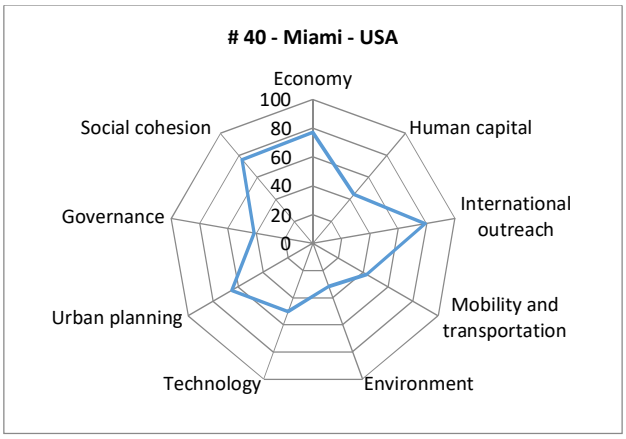
40 - Miami - USA
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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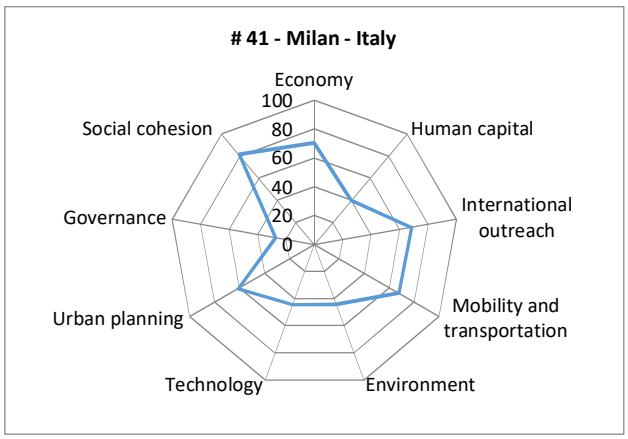
41 - Milan - Italy
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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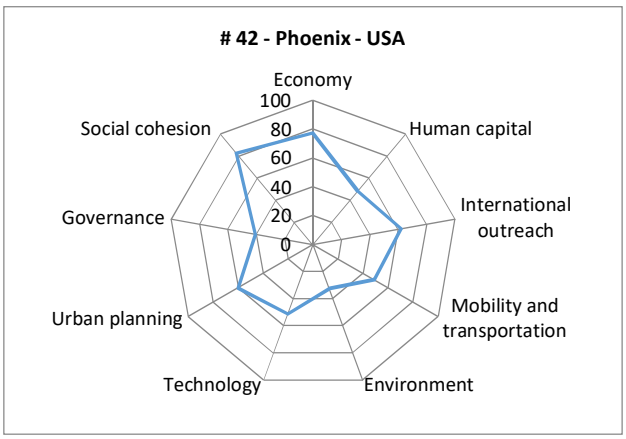
42 - Phoenix - USA
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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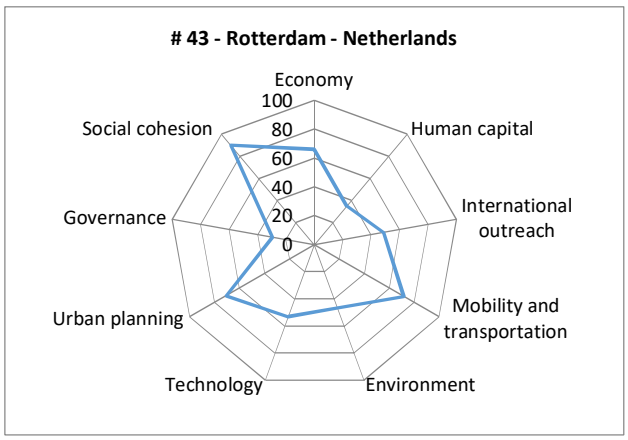
43 - Rotterdam - Netherlands
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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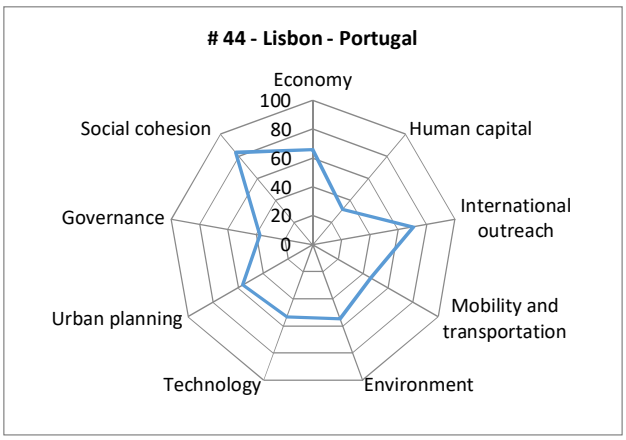
44 - Lisbon - Portugal
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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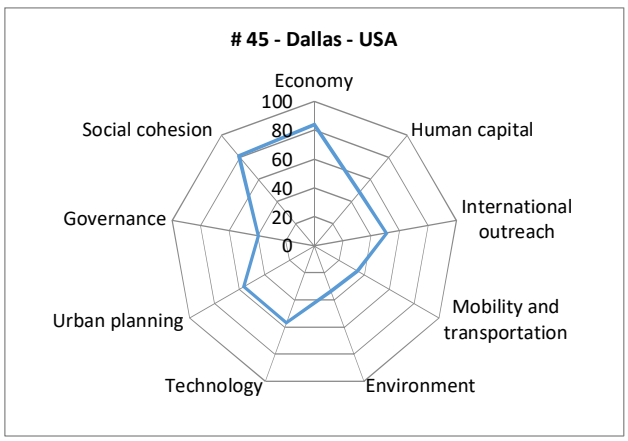
45 - Dallas - USA
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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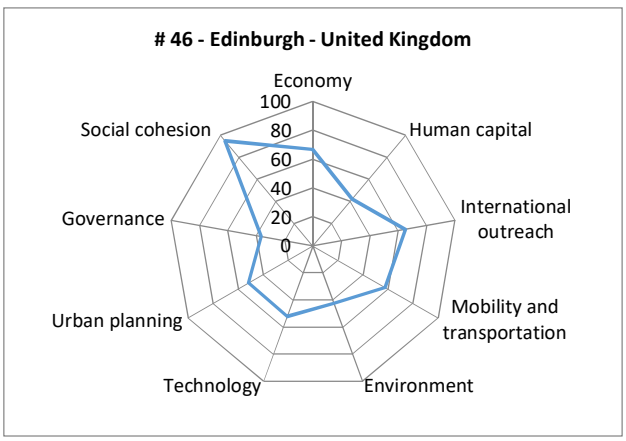
46 - Edinburgh - United Kingdom
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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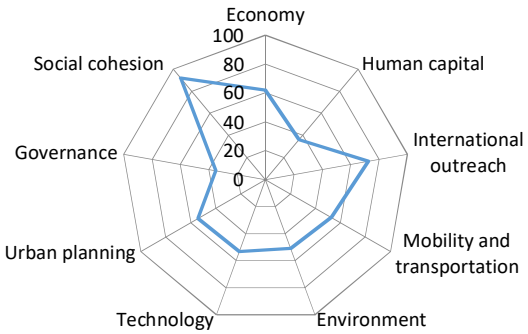
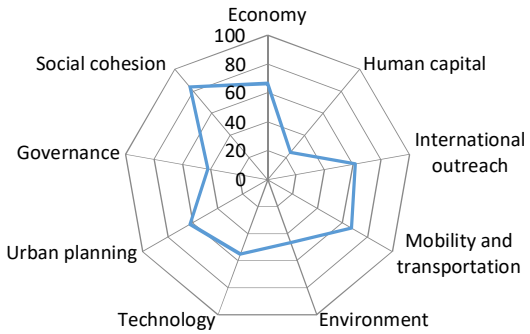
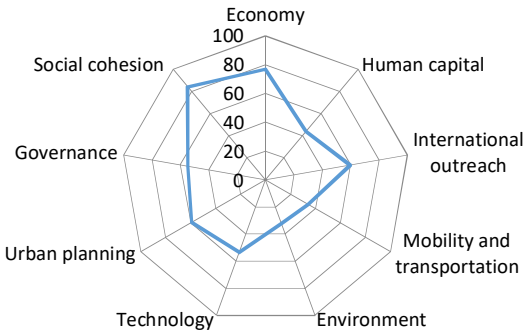
 # 47 - Prague - Czech Republic



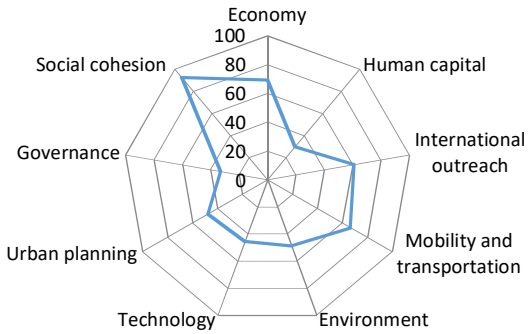
 # 48 - Brussels - Belgium



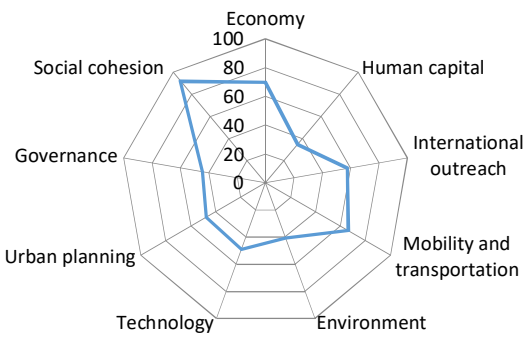
 # 49 - San Diego - USA



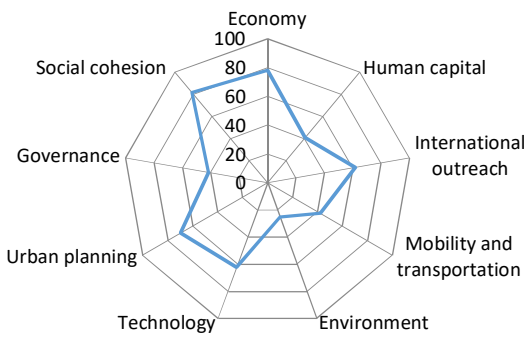
 # 50 - Düsseldorf - Germany



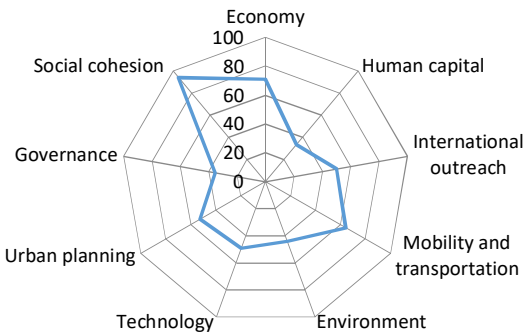
 # 51 - Cologne - Germany



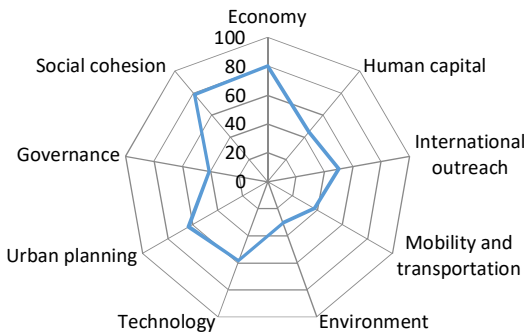
 # 52 - Denver - USA



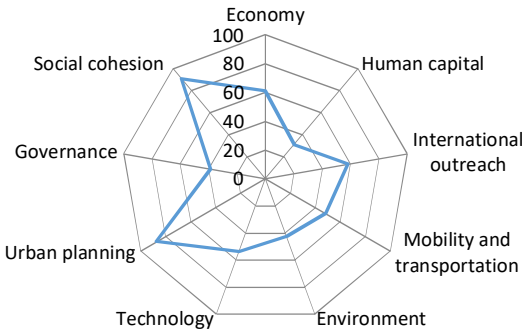
 # 53 - Stuttgart - Germany



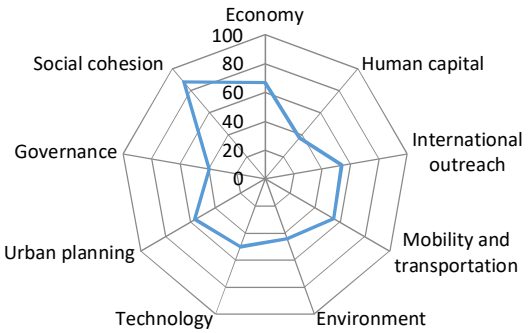
 # 54 - Philadelphia - USA



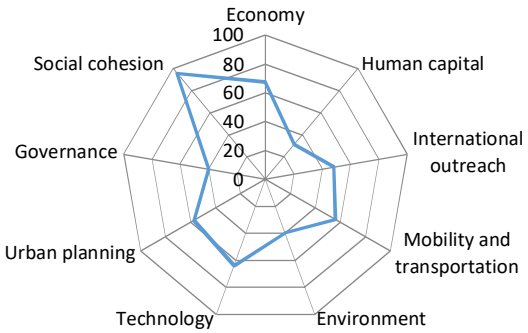
 # 55 - Vancouver - Canada



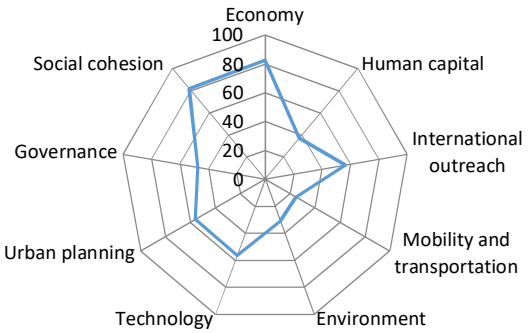
 # 56 - Lyon - France



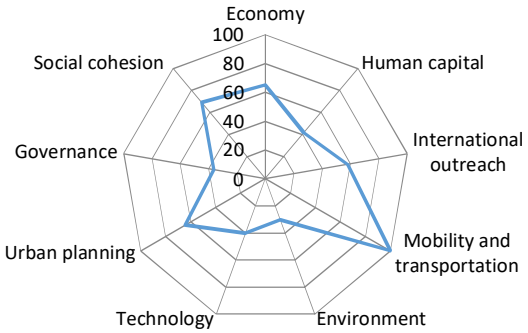
 # 57 - Eindhoven - Netherlands



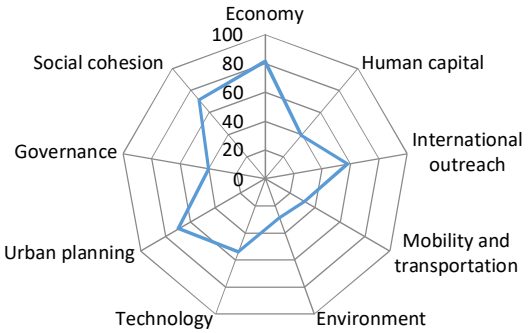
 # 58 - Seattle - USA



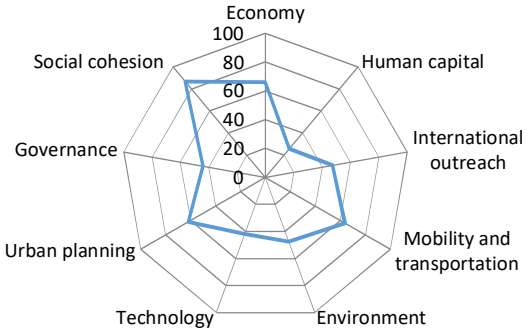
 # 59 - Shanghai - China



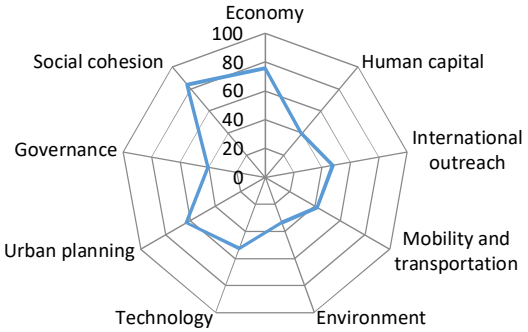
 # 60 - Houston - USA



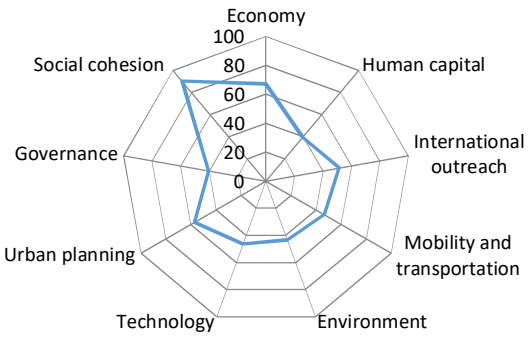
 # 61 - Valencia - Spain



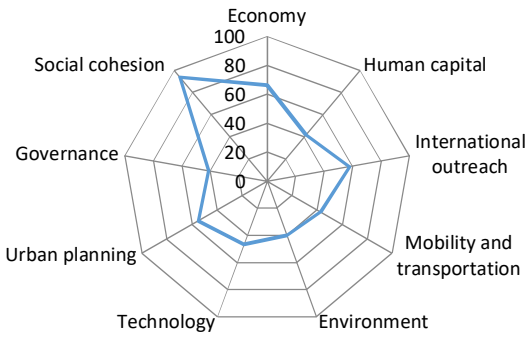
 # 62 - San Antonio - USA



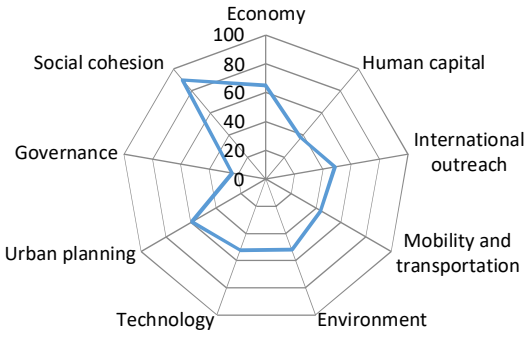
 # 63 - Birmingham - United Kingdom



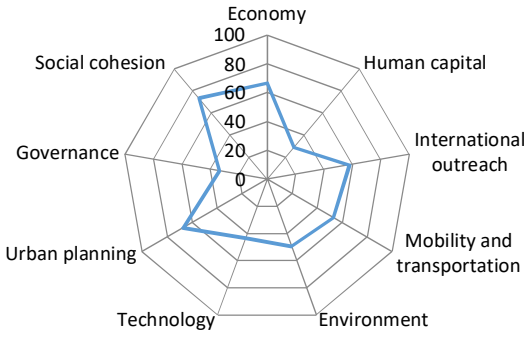
 # 64 - Glasgow - United Kingdom



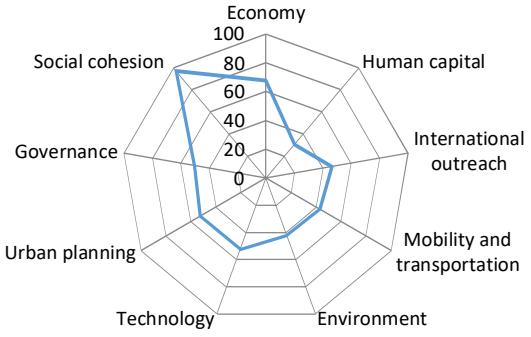
 # 65 - Tallinn - Estonia



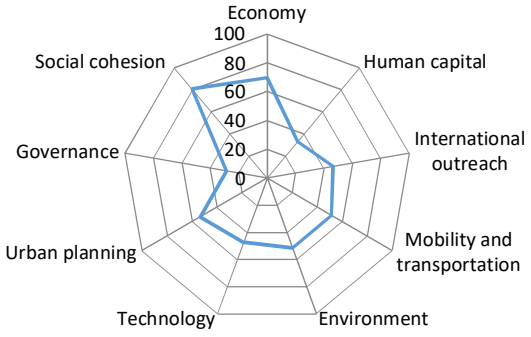
 # 66 - Santiago - Chile



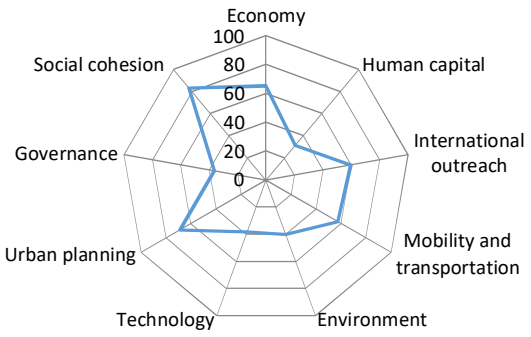
 # 67 - Quebec - Canada



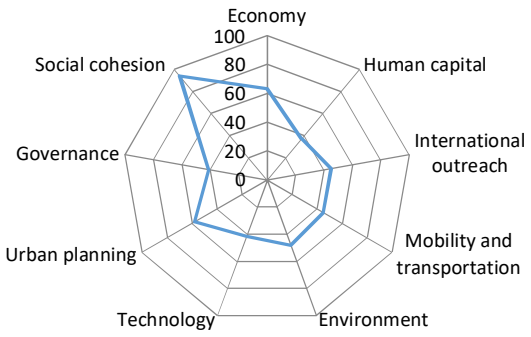
 # 68 - Osaka - Japan



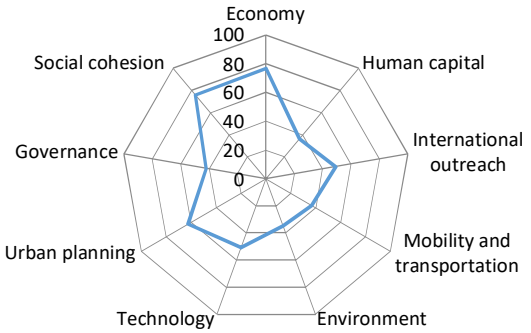
 # 69 - Warsaw - Poland



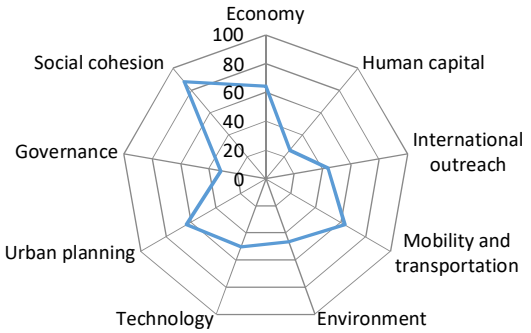
 # 70 - Bratislava - Slovakia



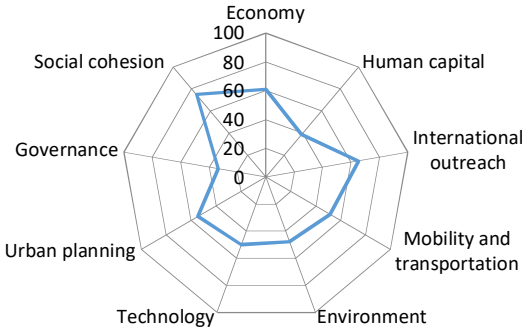
 # 71 - Baltimore - USA



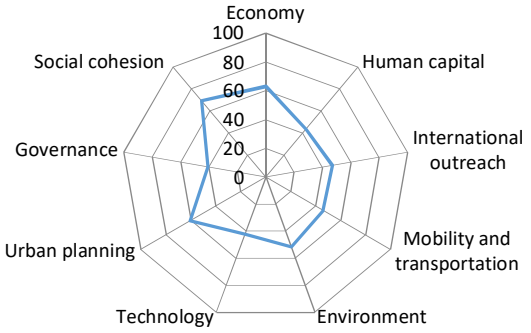
 # 72 - Antwerp - Belgium



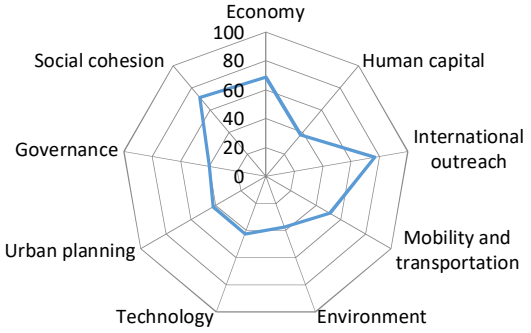
 # 73 - Budapest - Hungary



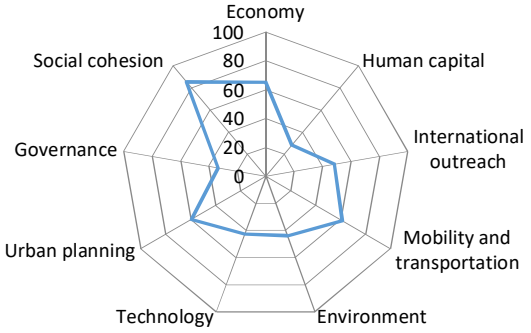
 # 74 - Vilnius - Lithuania



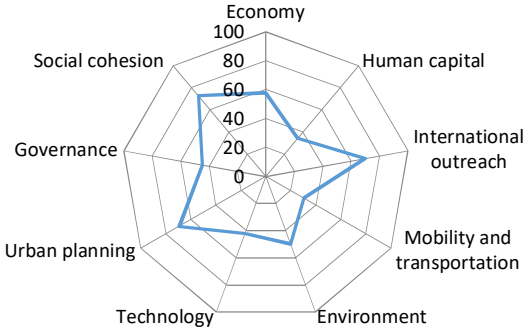
 # 75 - Rome - Italy



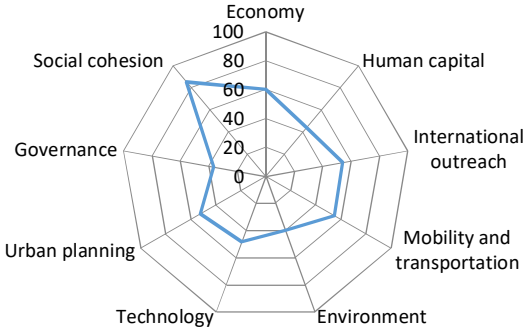
 # 76 - Seville - Spain



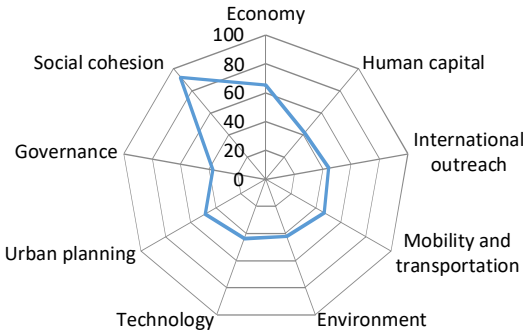
 # 77 - Buenos Aires - Argentina



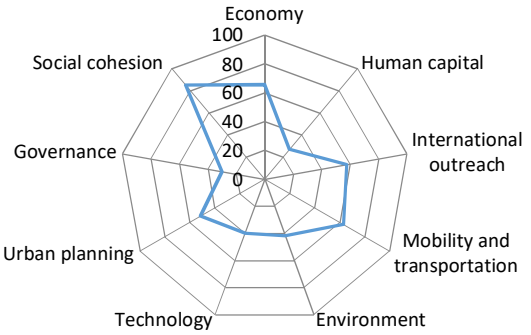
 # 78 - Manchester - United Kingdom



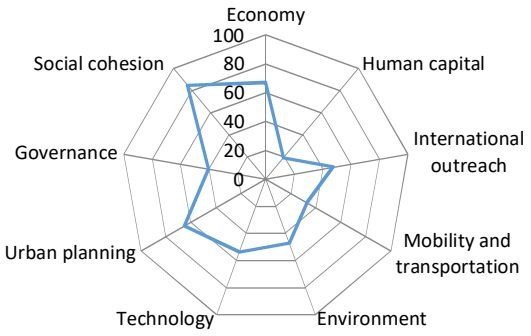
 # 79 - Leeds - United Kingdom



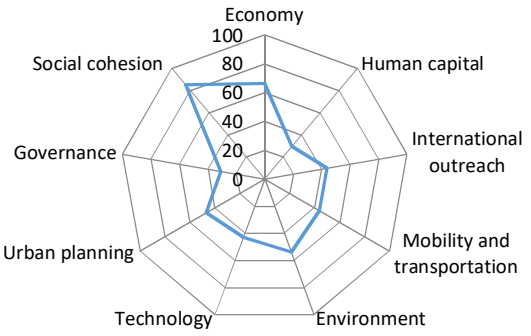
 # 80 - Málaga - Spain



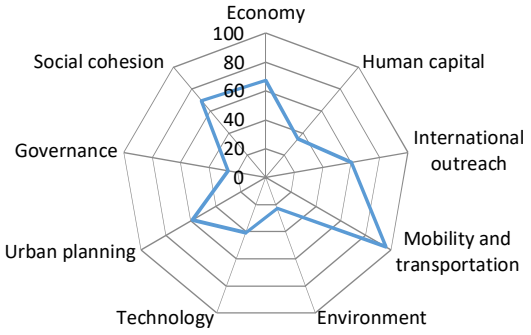
 # 81 - Tel Aviv - Israel



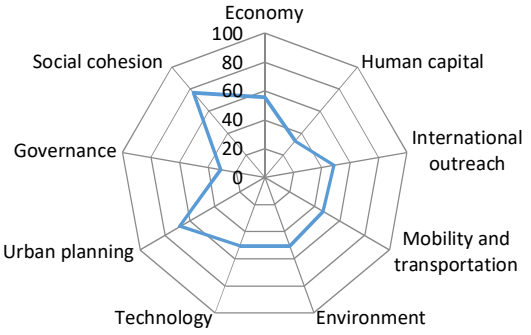
 # 82 - Nagoya - Japan



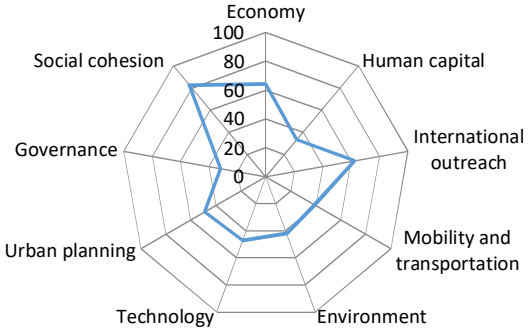
 # 83 - Beijing - China



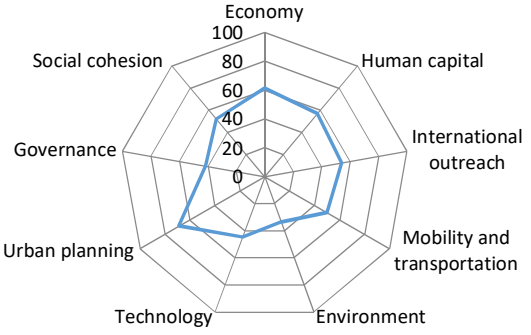
 # 84 - Riga - Latvia



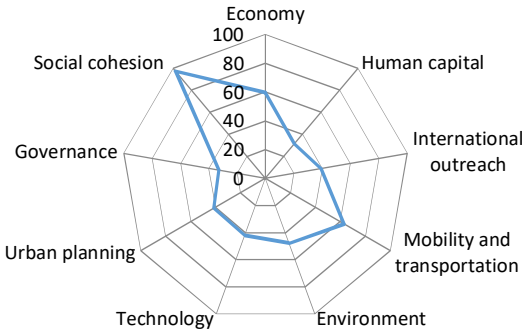
 # 85 - Nice - France



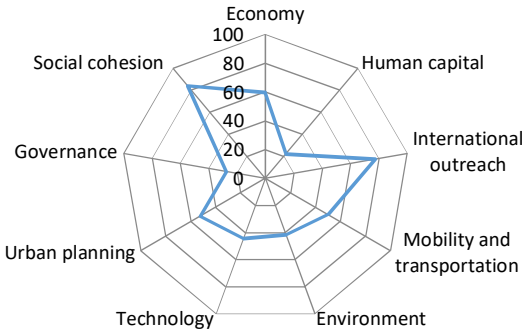
 # 86 - Moscow - Russia



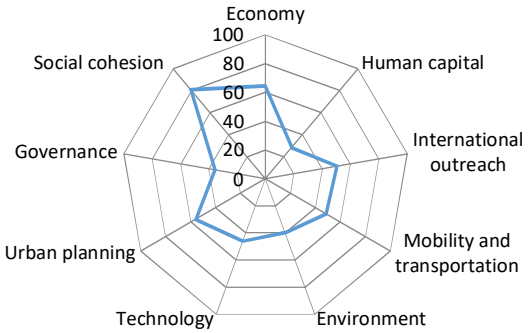
 # 87 - Linz - Austria



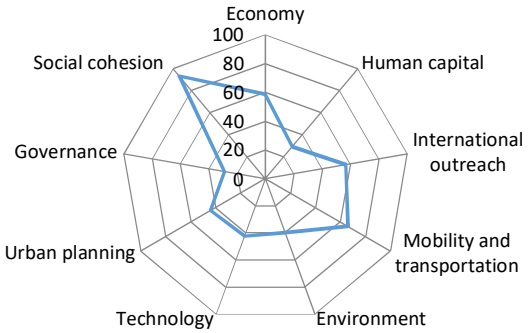
 # 88 - Palma de Mallorca - Spain



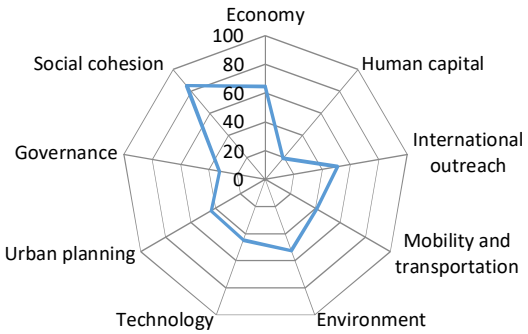
 # 89 - Marseille - France



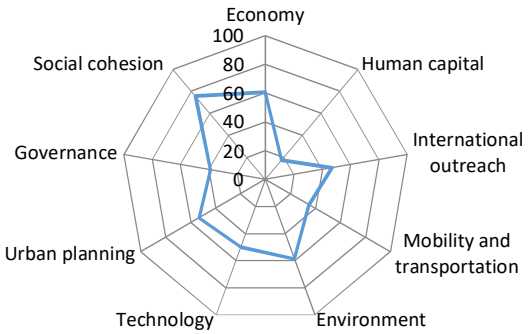
 # 90 - Duisburg - Germany



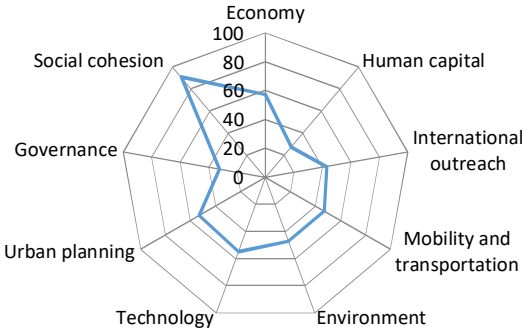
 # 91 - Porto - Portugal



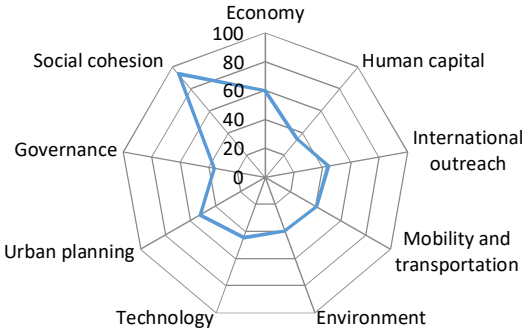
 # 92 - Montevideo - Uruguay

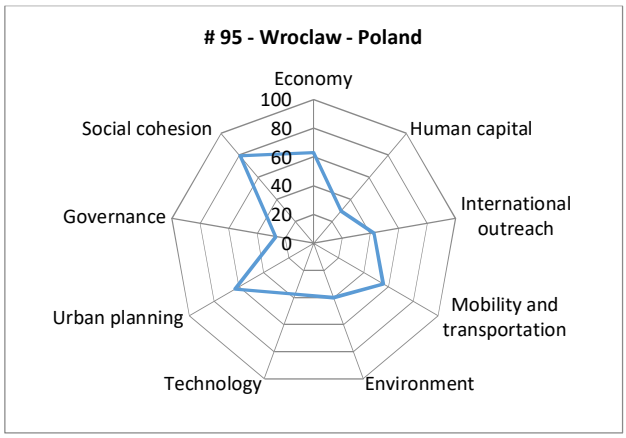


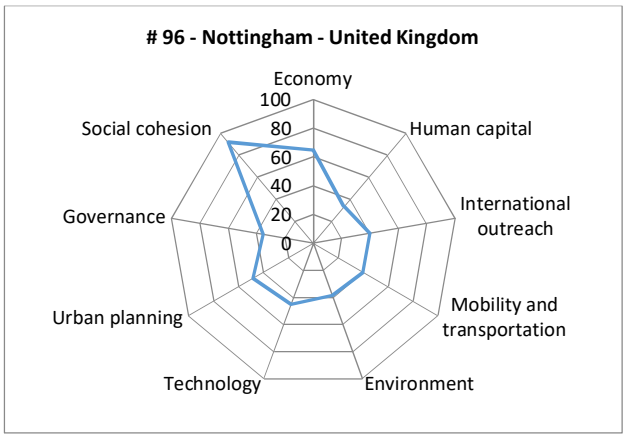
 # 93 - Ljubljana - Slovenia

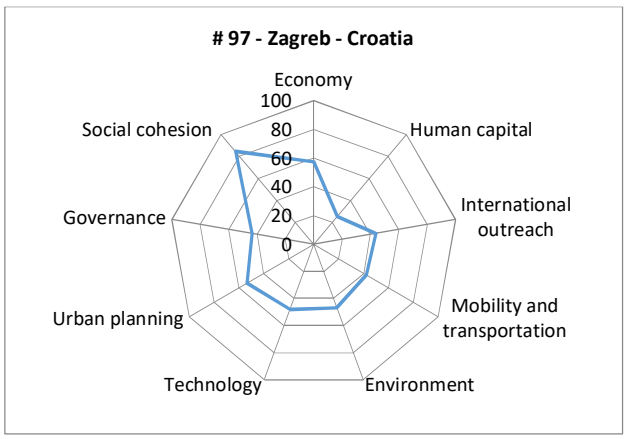


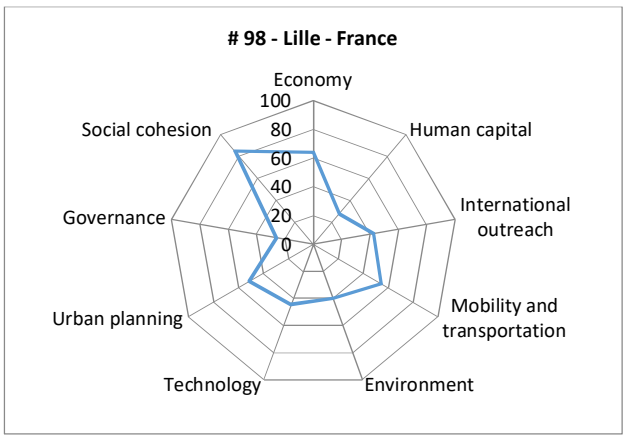
 # 94 - Liverpool - United Kingdom

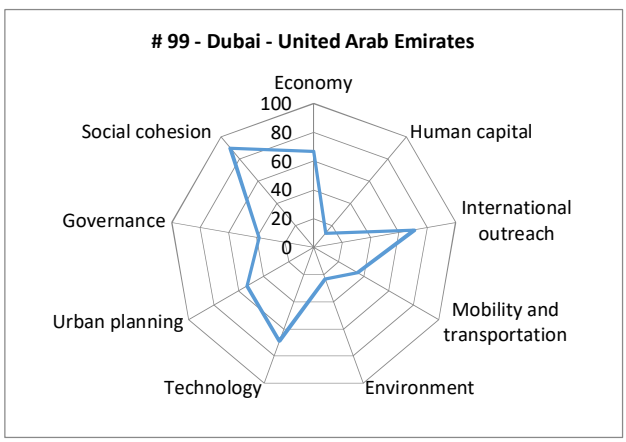


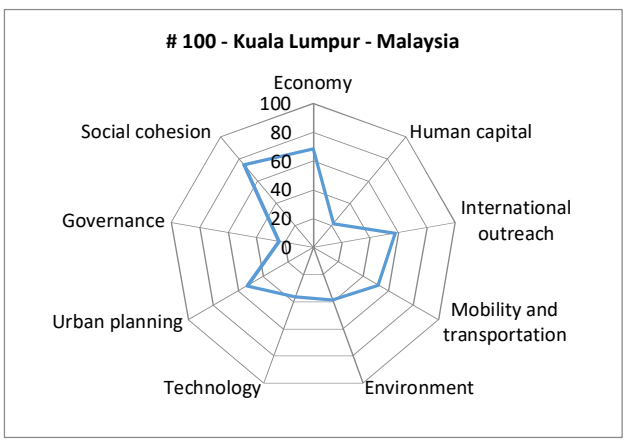

95 - Wroclaw - Poland
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
60
40
20
0

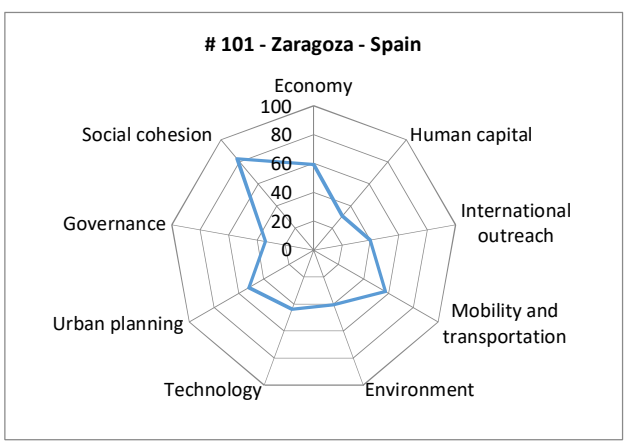

96 - Nottingham - United Kingdom
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
60
40
20
0

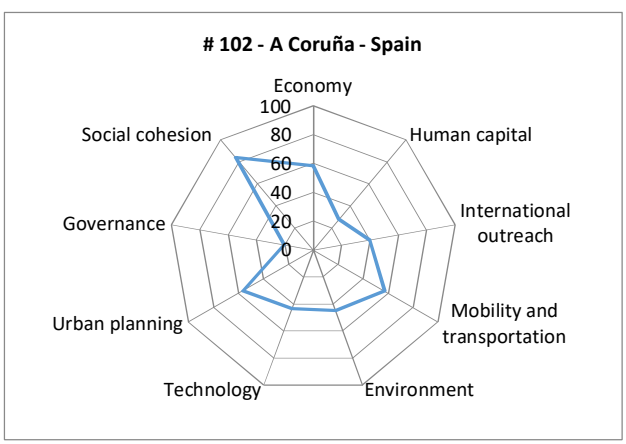

97 - Zagreb - Croatia
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
60
40
20
0


98 - Lille - France
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
60
40
20
0

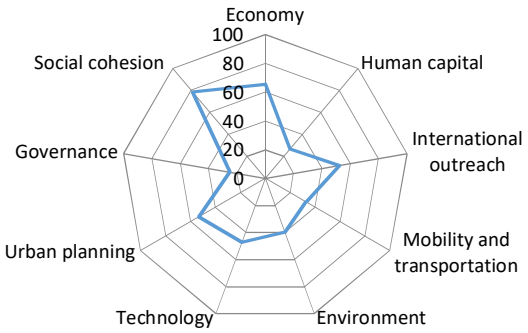

99 - Dubai - United Arab Emirates
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
60
40
20
0


100 - Kuala Lumpur - Malaysia
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
60
40
20
0

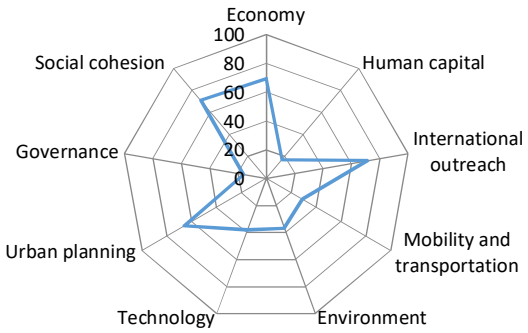

101 - Zaragoza - Spain
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
60
40
20
0


102 - A Coruña - Spain
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
80
60
40
20
0

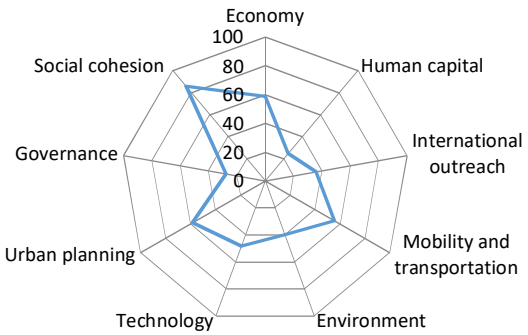
 # 103 - Bucharest - Romania



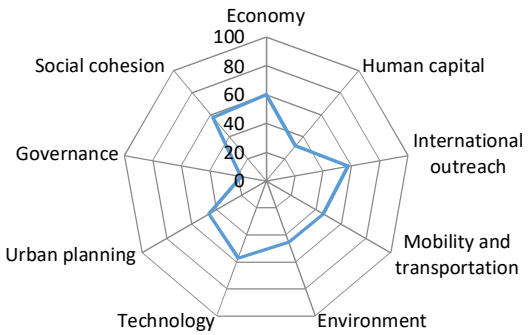
 # 104 - Bangkok - Thailand



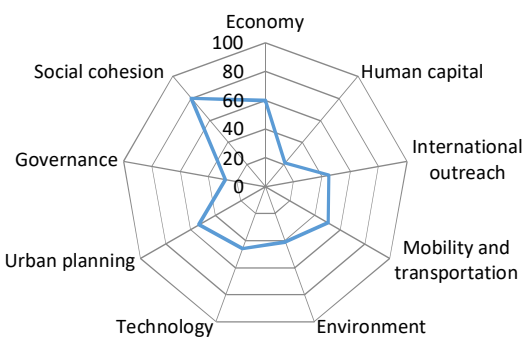
 # 105 - Murcia - Spain



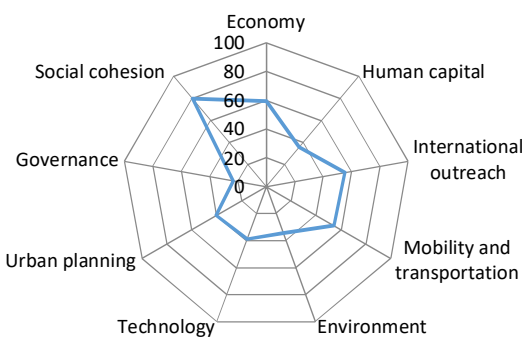
 # 106 - Athens - Greece



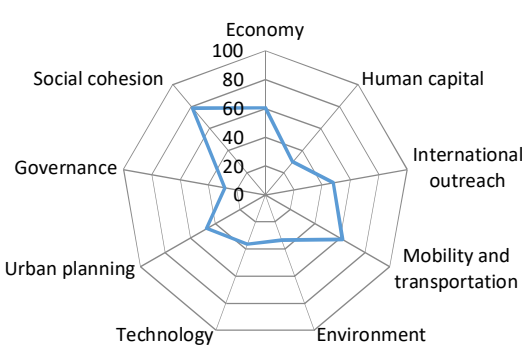
 # 107 - Bilbao - Spain



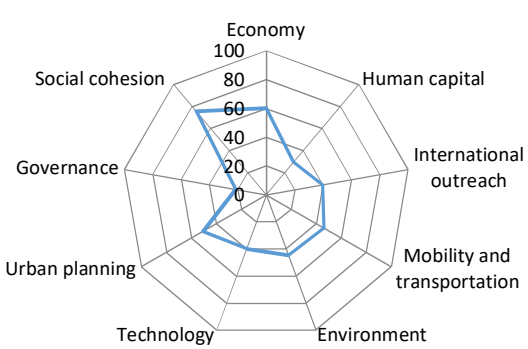
 # 108 - Florence - Italy



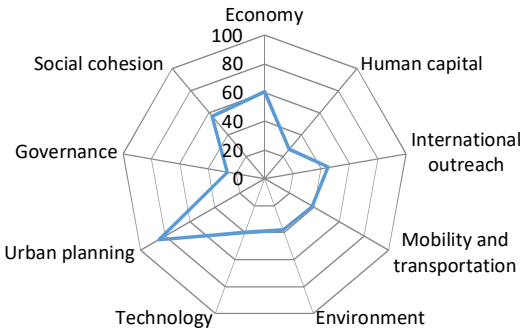
 # 109 - Turin - Italy



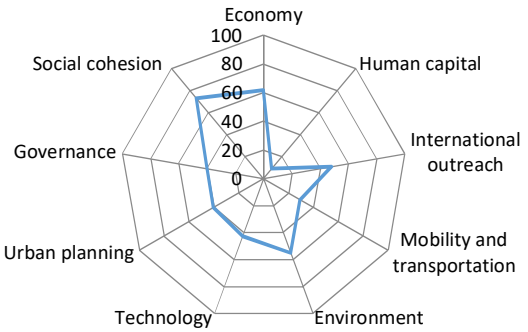
 # 110 - Minsk - Belarus



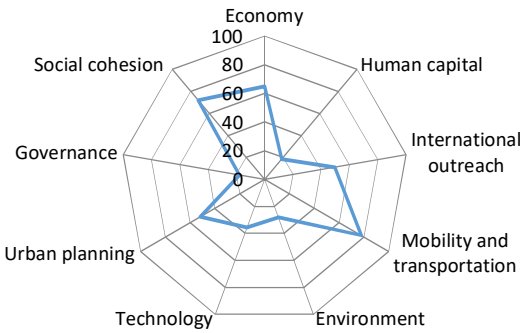
 # 111 - Kiev - Ukraine



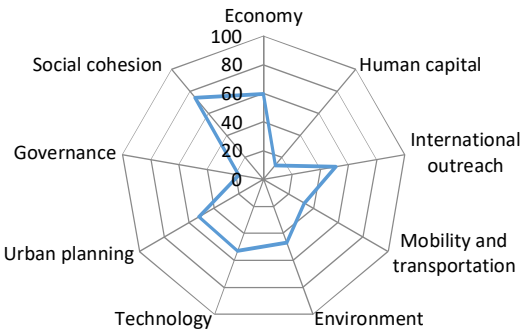
 # 112 - San José - Costa Rica



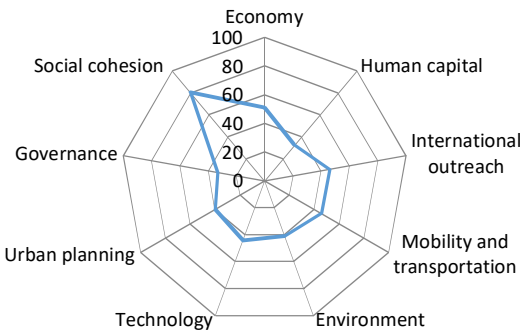
 # 113 - Guangzhou - China



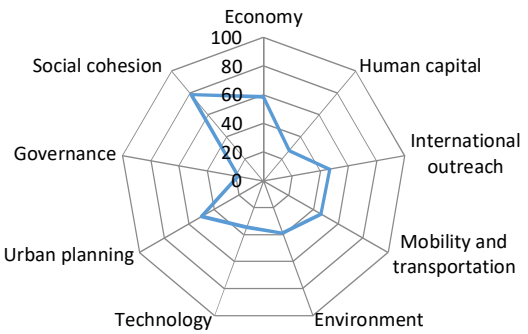
 # 114 - Panama - Panama



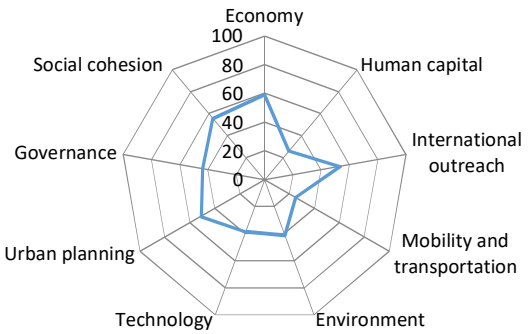
 # 115 - Sofia - Bulgaria



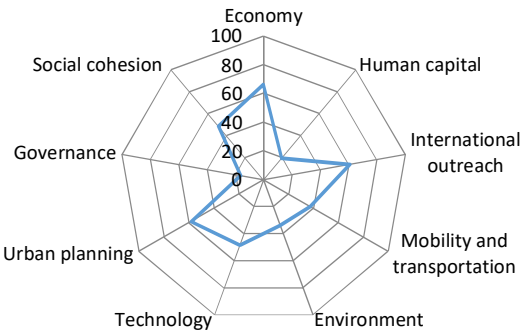
 # 116 - Naples - Italy

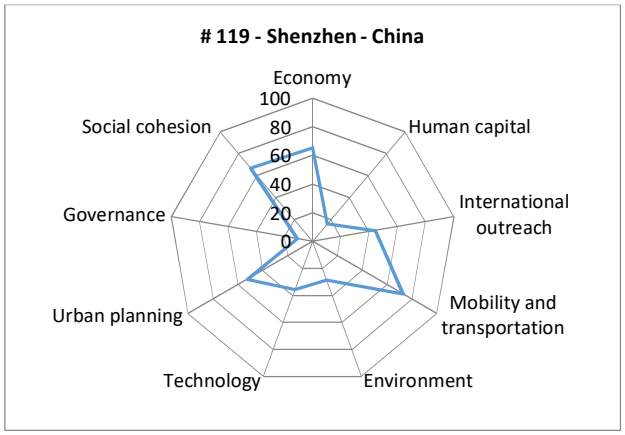


 # 117 - Bogotá - Colombia



 # 118 - Istanbul - Turkey




119 - Shenzhen - China
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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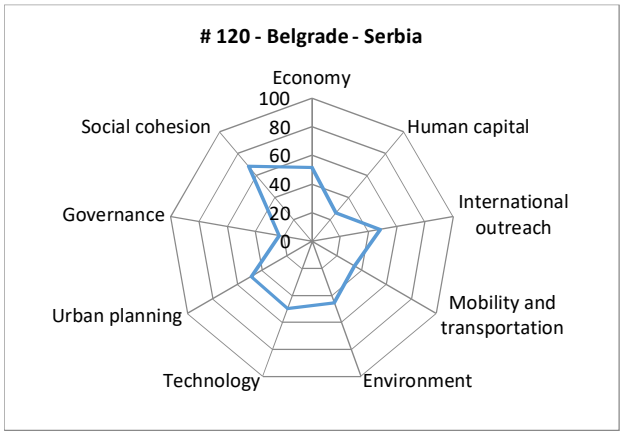
120 - Belgrade - Serbia
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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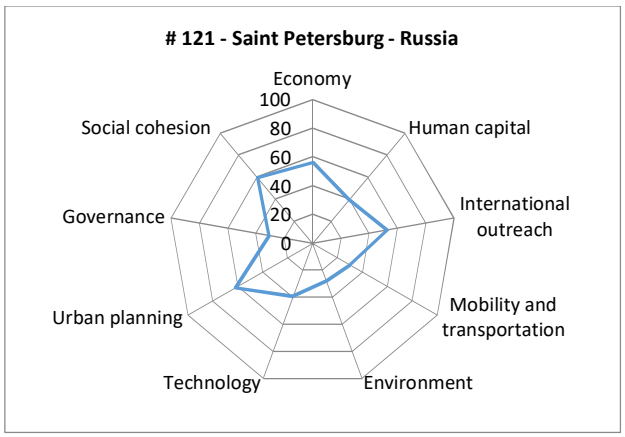
121 - Saint Petersburg - Russia
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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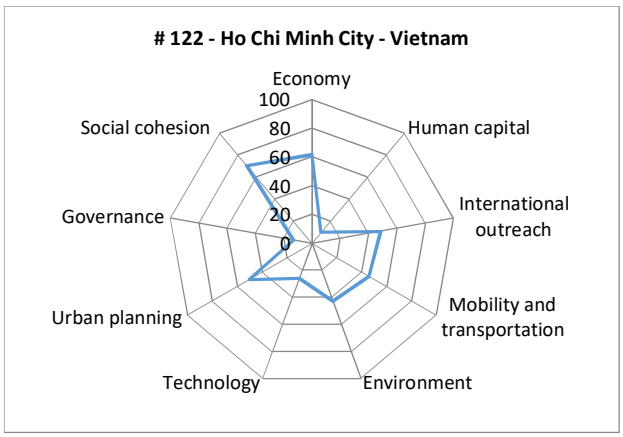
122 - Ho Chi Minh City - Vietnam
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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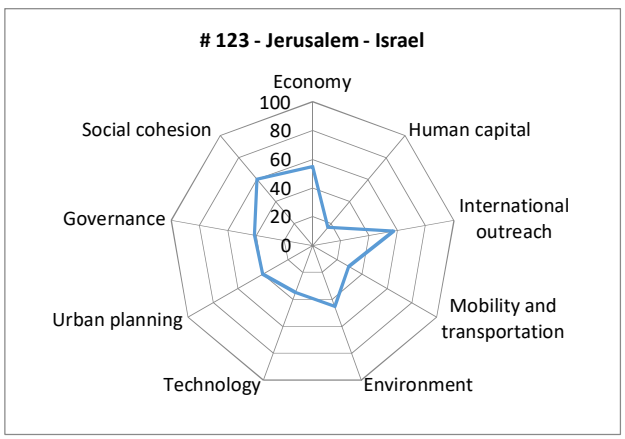
123 - Jerusalem - Israel
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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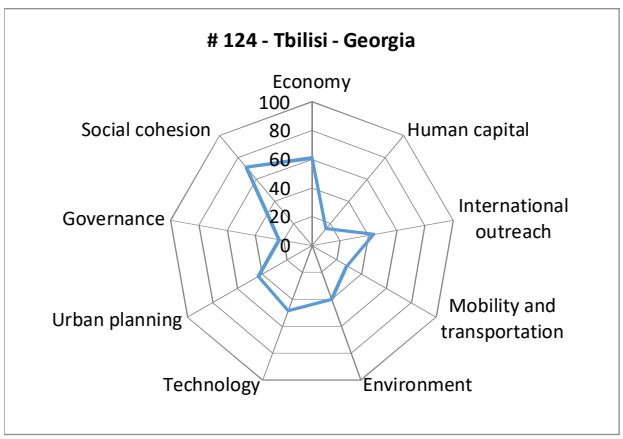
124 - Tbilisi - Georgia
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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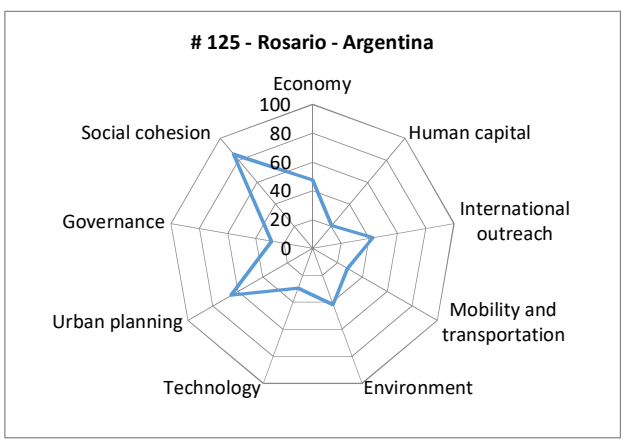
125 - Rosario - Argentina
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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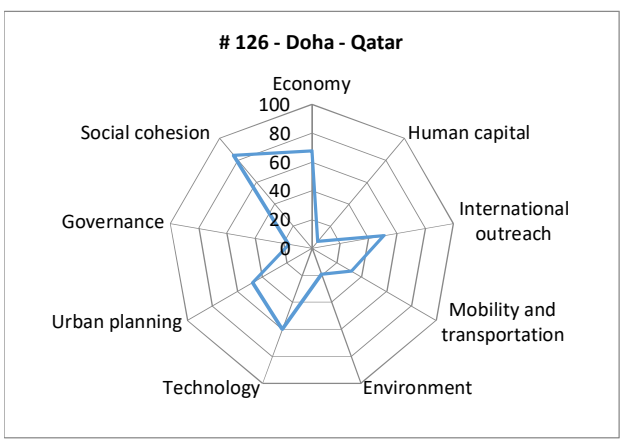
126 - Doha - Qatar
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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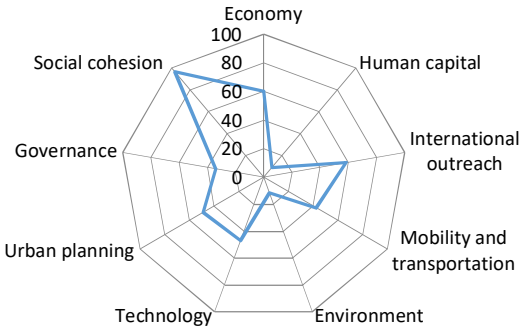
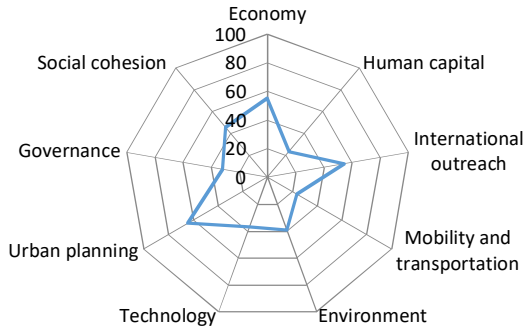
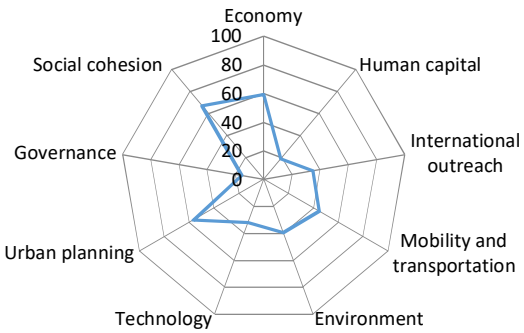
 # 127 - Abu Dhabi - United Arab Emirates



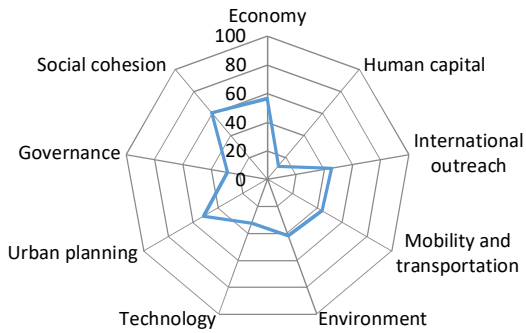
 # 128 - Rio de Janeiro - Brazil



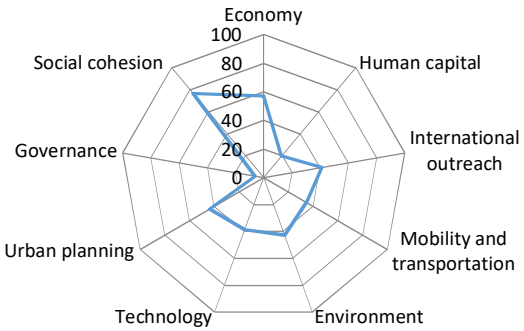
 # 129 - Almaty - Kazakhstan



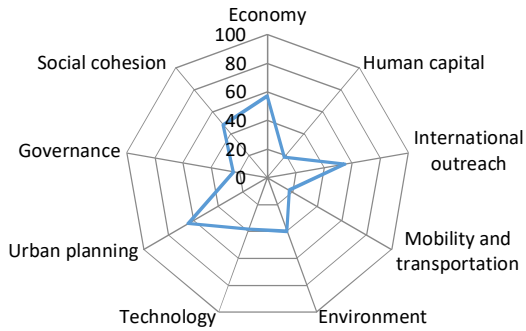
 # 130 - Brasília - Brazil



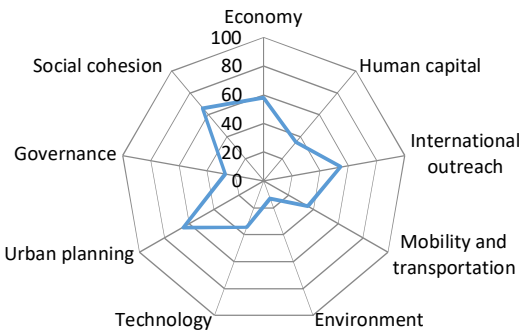
 # 131 - Baku - Azerbaijan



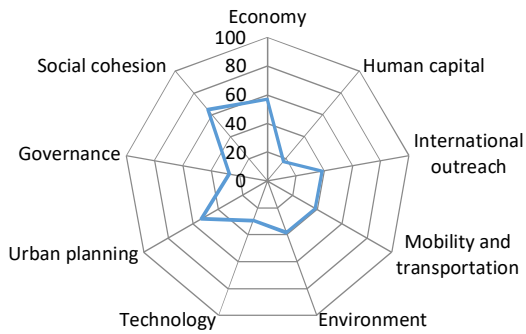
 # 132 - São Paulo - Brazil



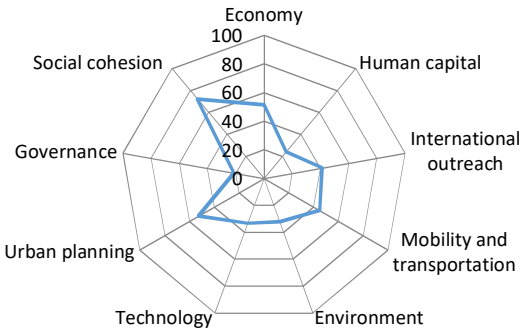
 # 133 - Mexico City - Mexico



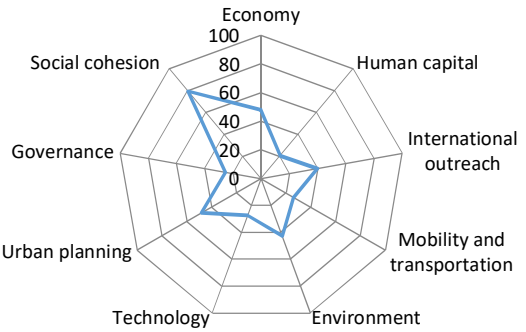
 # 134 - Medellín - Colombia



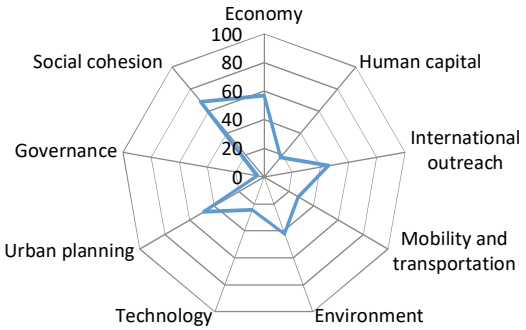
 # 135 - Ankara - Turkey



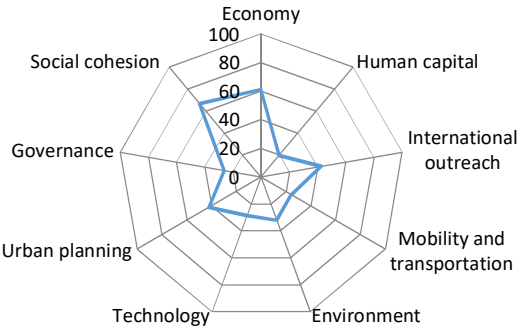
 # 136 - Córdoba - Argentina



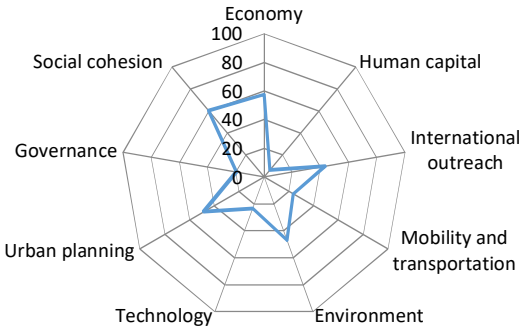
 # 137 - Quito - Ecuador



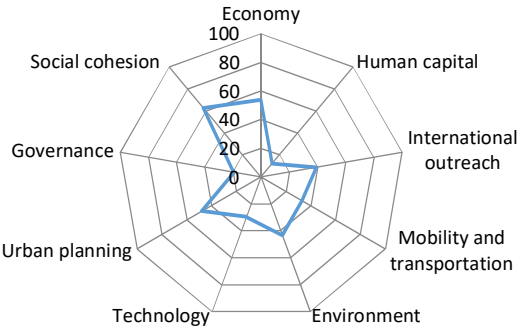
 # 138 - Lima - Peru



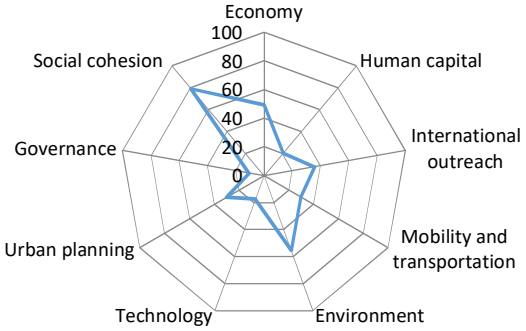
 # 139 - Santo Domingo - Dominican Republic



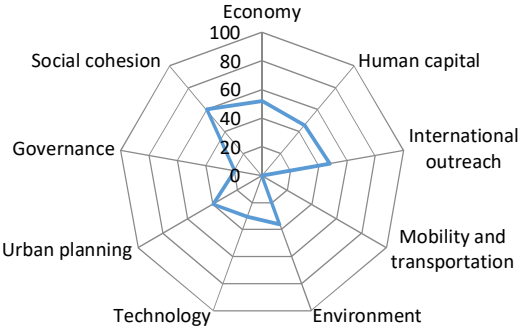
 # 140 - Curitiba - Brazil



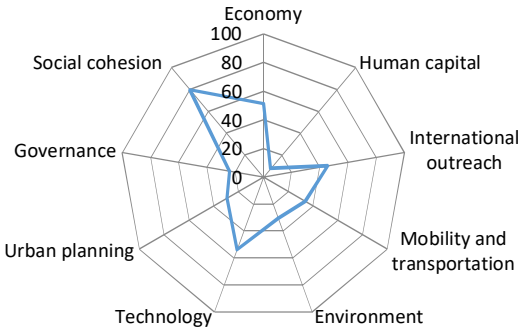
 # 141 - Asunción - Paraguay



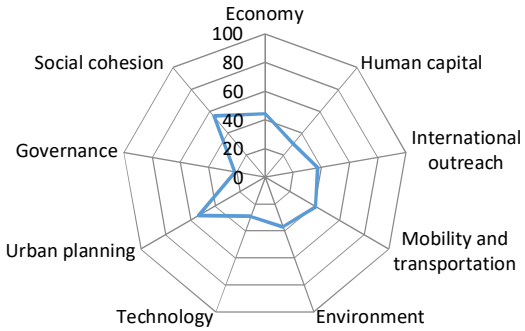
 # 142 - Jakarta - Indonesia



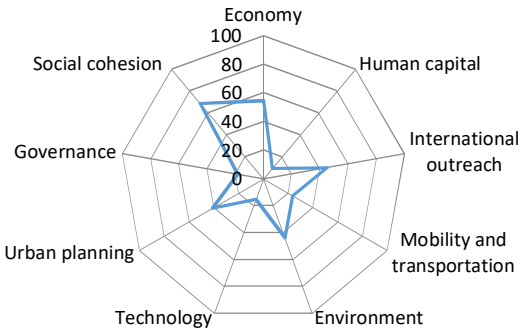
 # 143 - Kuwait City - Kuwait



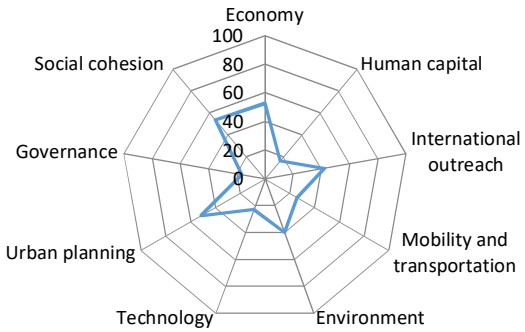
 # 144 - Sarajevo - Bosnia-Herzegovina



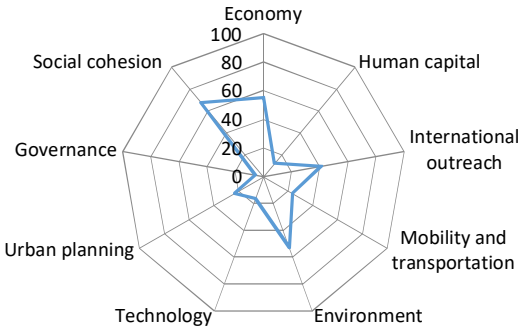
 # 145 - La Paz - Bolivia



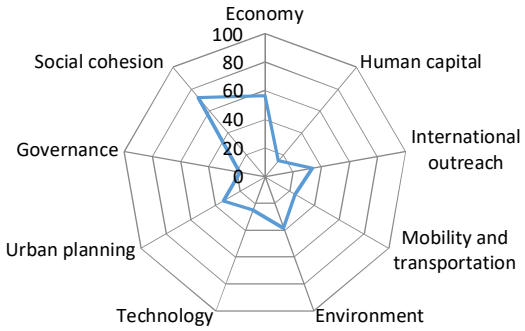
 # 146 - Salvador - Brazil



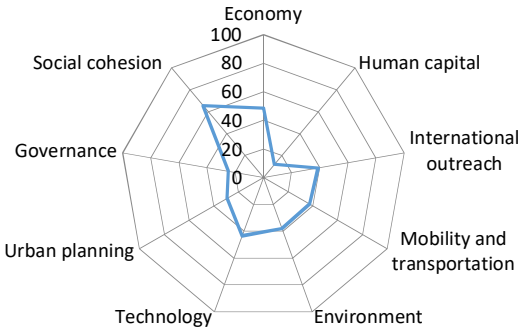
 # 147 - Santa Cruz - Bolivia



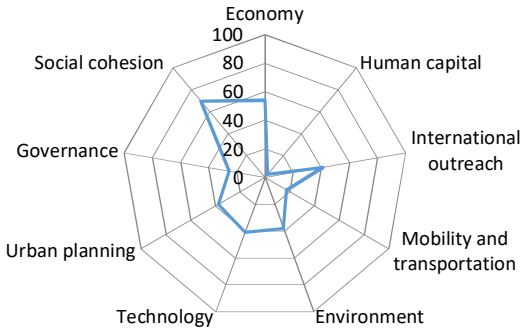
 # 148 - Cali - Colombia



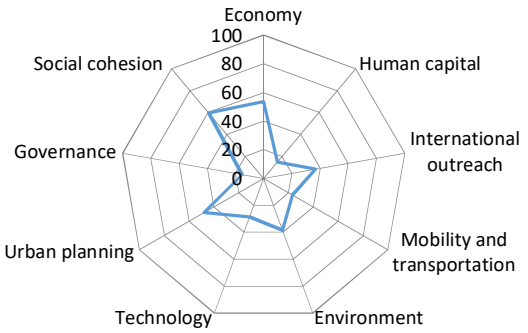
 # 149 - Skopje - North Macedonia



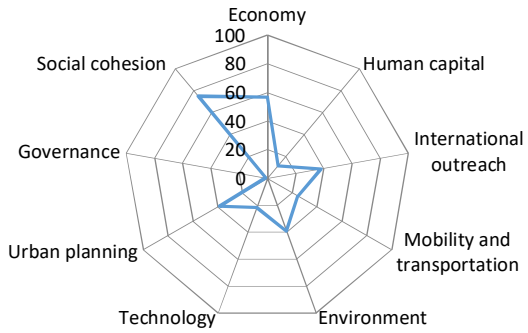
 # 150 - Amman - Jordan



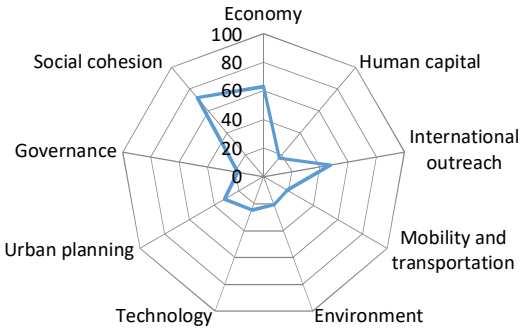
 # 151 - Belo Horizonte - Brazil



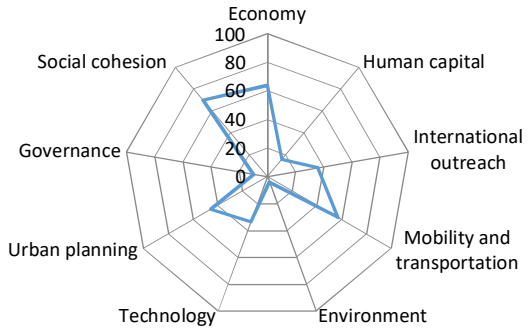
 # 152 - Guayaquil - Ecuador



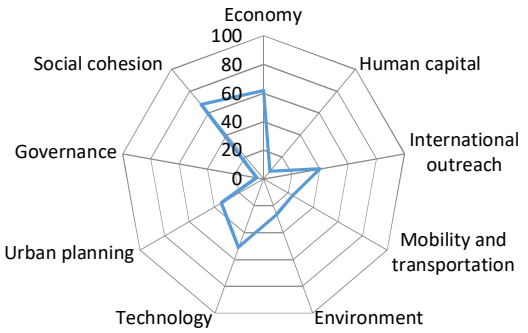
 # 153 - Bangalore - India



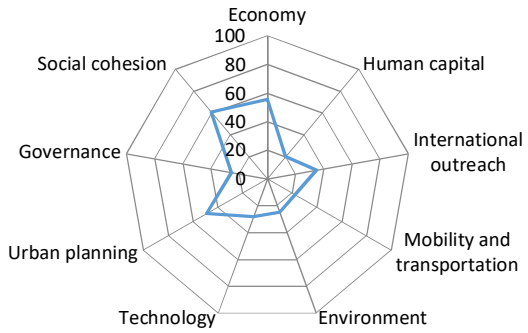
 # 154 - Tianjin - China



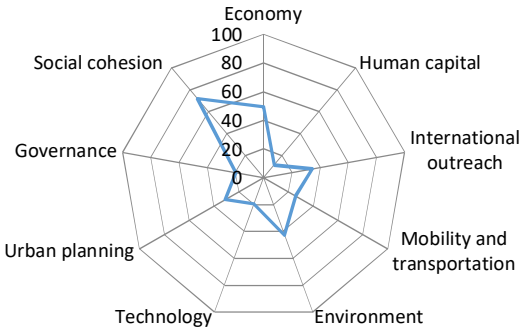
 # 155 - Casablanca - Morocco



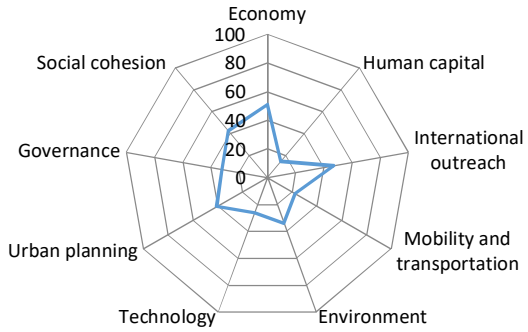
 # 156 - Novosibirsk - Russia

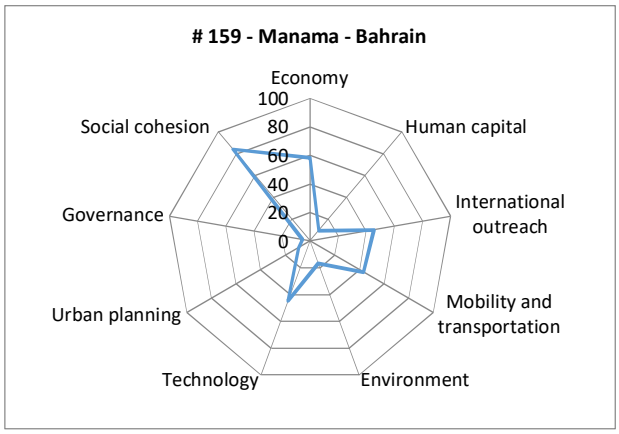


 # 157 - Tunis - Tunisia



 # 158 - Cape Town - South Africa




159 - Manama - Bahrain
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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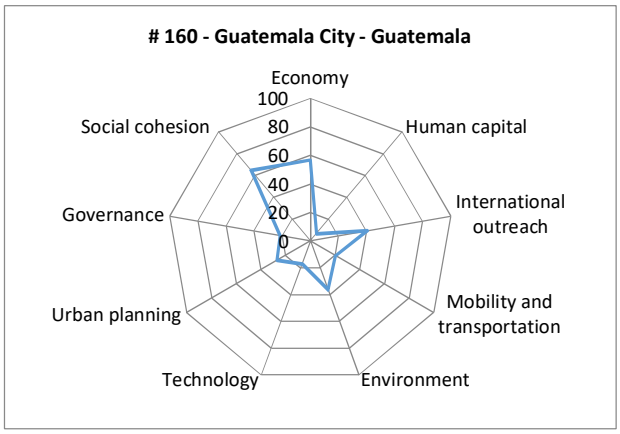
160 - Guatemala City - Guatemala
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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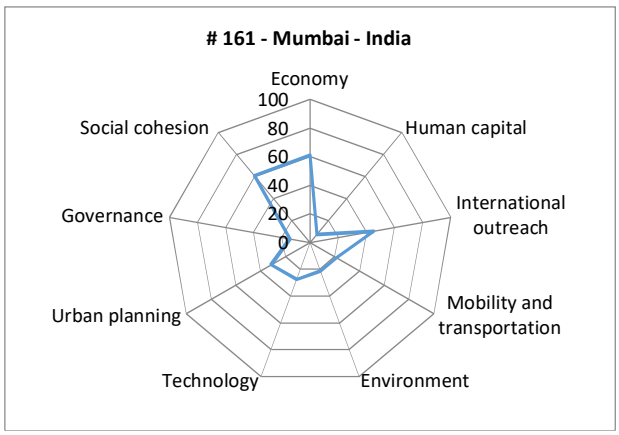
161 - Mumbai - India
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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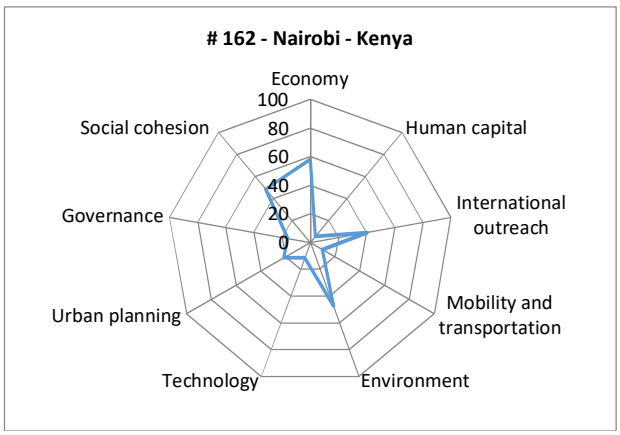
162 - Nairobi - Kenya
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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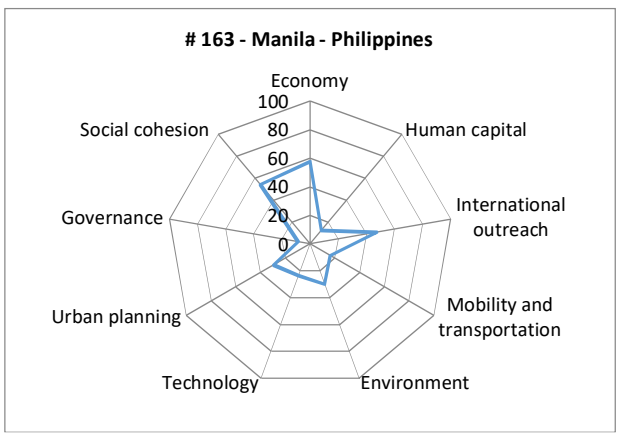
163 - Manila - Philippines
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
100
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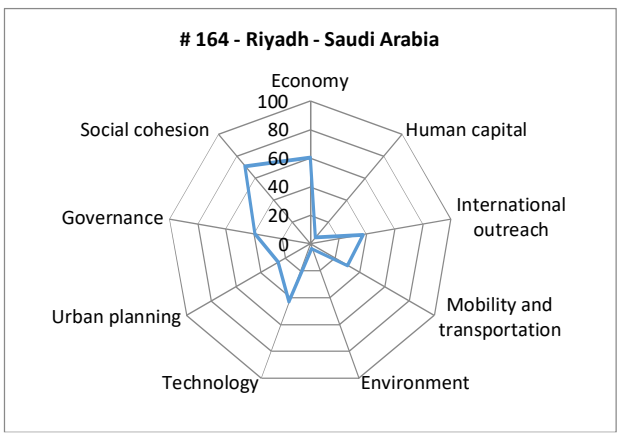
164 - Riyadh - Saudi Arabia
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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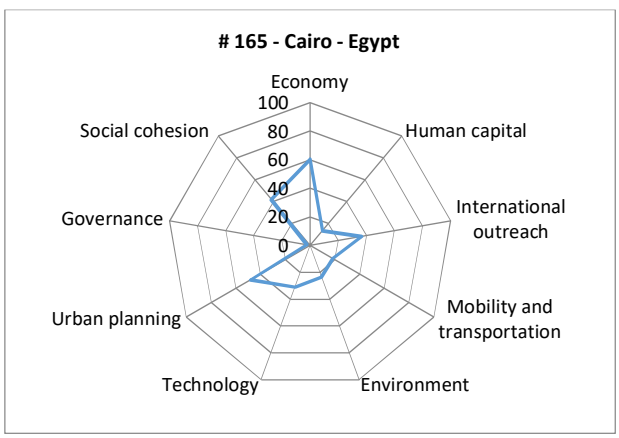
165 - Cairo - Egypt
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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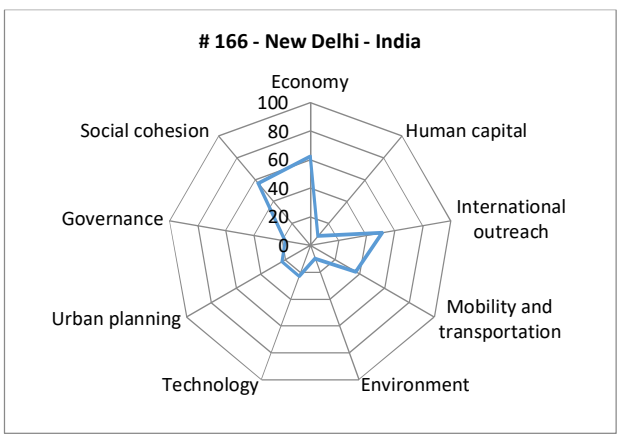
166 - New Delhi - India
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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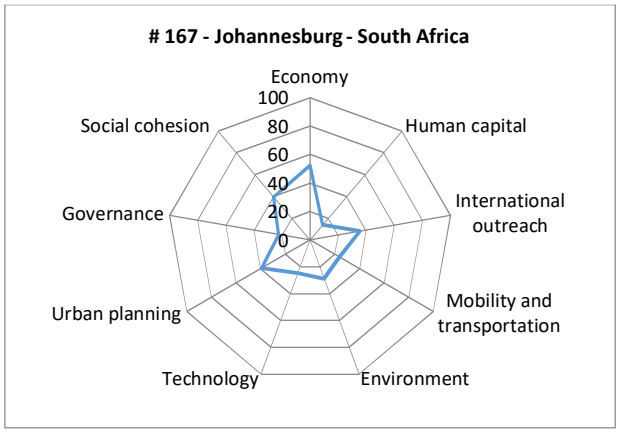
167 - Johannesburg - South Africa
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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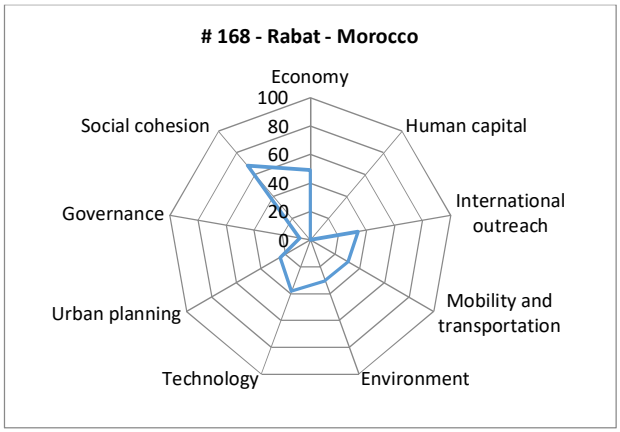
168 - Rabat - Morocco
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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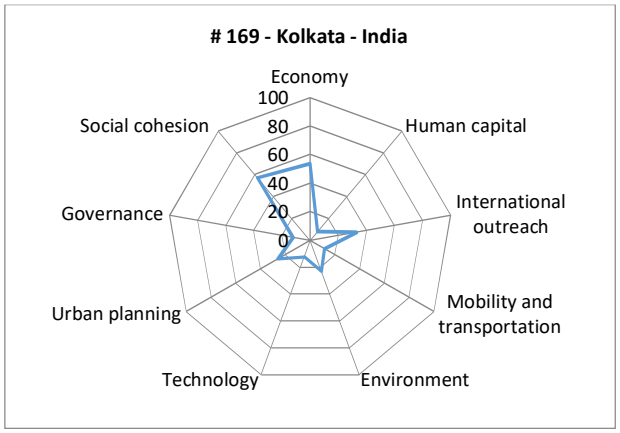
169 - Kolkata - India
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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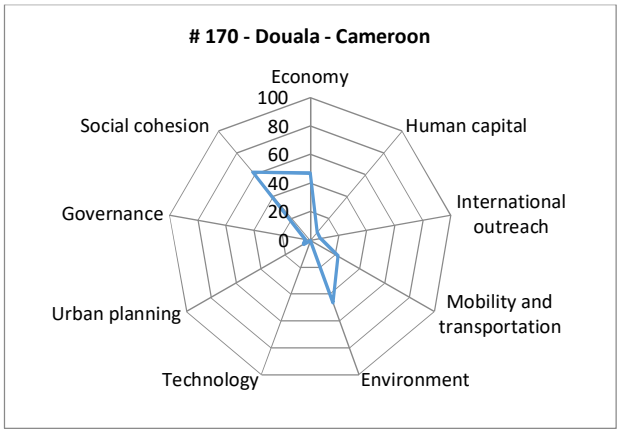
170 - Douala - Cameroon
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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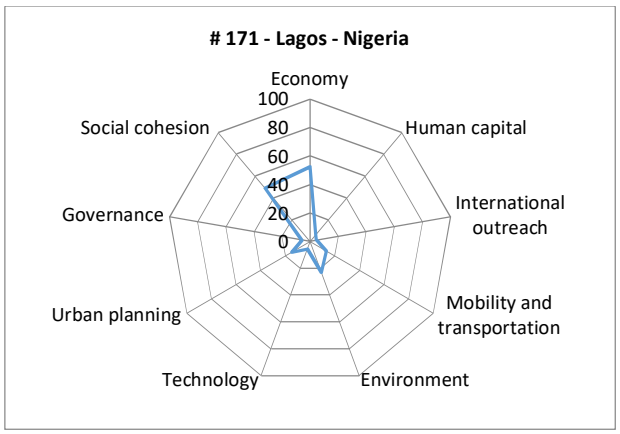
171 - Lagos - Nigeria
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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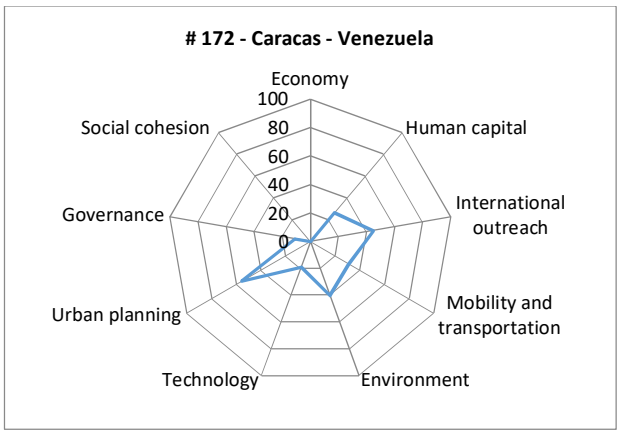
172 - Caracas - Venezuela
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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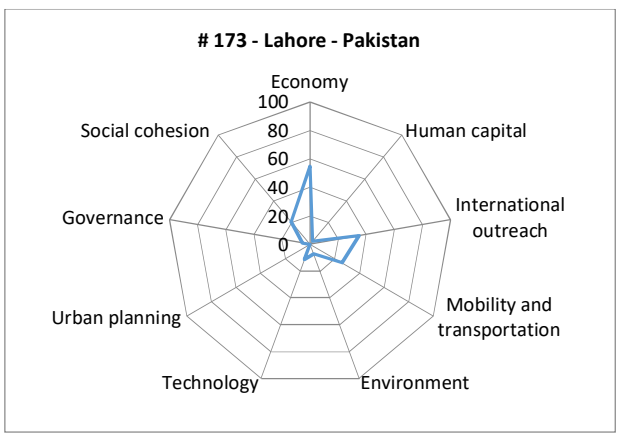
173 - Lahore - Pakistan
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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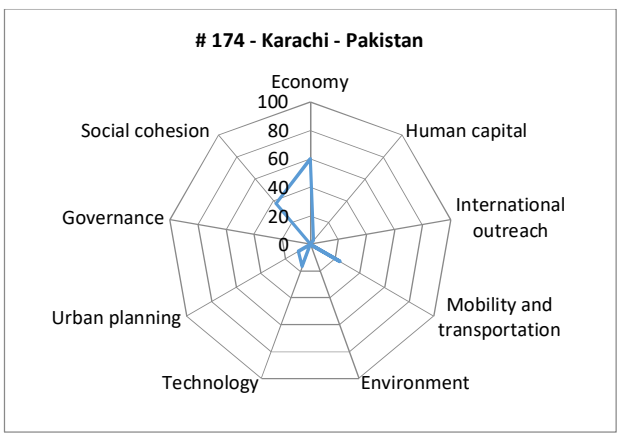
174 - Karachi - Pakistan
Economy
Human capital
International outreach
Mobility and transportation
Environment
Technology
Urban planning
Governance
Social cohesion
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