

# 2021 Global City Talent Retention Index



Beijing Institute of Talent Development Strategy

**BITS**



Beijing Foreign Enterprise Service Group Co. Ltd.





## About The Global City Talent Retention Index 2021

In order to analyze the new driving force of economic growth, learn the latest trends of global talent flow, and promote the reform of city administrator's talent-relevant strategy, Beijing Institute of Talent Development Strategy proposed "The city talent retention" by combining the cases and experience of global city talent concentration and the latest development trends.

Starting from 2020, Beijing Institute of Talent Development Strategy and Beijing Foreign Enterprise Human Resources Service Co, Ltd. jointly released "The Global City Talent Retention Index Report". The report focuses on the improvement of city talent development environment, analyzes the factors of attracting talents, investigates talents' perception of living conditions, discusses how to serve talents better, take care of , and help political leaders to shape policy agenda.

### Key Insights

- ◆ We need to strive to change the philosophy of talent work. Talent retention focuses on caring for talents, improving the talent development environment, and enhancing the perception of talent experience, which is closely aligned with the concept of "talent-oriented" and "multilateral win-win cooperation." This report aims to promote the conceptual change regarding talent work of global city administrators and guide them to humbly serve talents.

- ◆ Talent work should be implemented by commission and omission. Since talent demand is changing rapidly, the weak points of city development are stagnating, and talent development is systematic, which makes solve all of the left-behind areas of talent development in a short term is extremely difficult. To fix the weak spots of city talent development, we need to allocate resources in an effective way to improve talent retention.

- ◆ Under the shadow of the COVID-19 Pandemic, cities around the world face opportunities when in danger. Cities with successful virus prevention and control have become the "safe harbor" for talents to work and live, which provides necessary conditions for seizing the opportunity to attract and retain talents. As a symbol of cultural openness and cohesiveness, "the net number of immigrants" is a "mirror" of cities retention.

- ◆ Digital talents have become an important asset to realize the global economic recovery. Digital technologies, represented by artificial intelligence, big data and the Internet of Things, are deeply integrated with traditional industries, unleashing enormous energy and playing an important role in global economic recovery. The flow of digital talents is a key element to realize the sharing of "digital achievements", the symbiosis of "digital cooperation" , and the "win-win" situation in the era of digital economy. It is also the core driving force to promote the global economic recovery.

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## Foreword

2021 is a phase of recovery and development for the global economy and an important window of opportunity for the innovation of new technologies. The key point in the innovation-driven development is how to attract, retain the talents and avoid talent outflow. With the growing need of innovative talents, the brain drain has become a common challenge for the urban development across the world. Therefore, a sufficient reserve of innovative talents has captured the eyesight of urban administrators who start to emphasize the improvement of the talents' feeling and sense of belonging, and pay attention to the talents' senses of gain and satisfaction in their cities. The administrators' function has been transformed from administration to service, and offering more care to talents has become a new trend of city talent work.

The city talent retention index, as an intuitive and realistic assessment index that can reflect the ecology of talent development in a city, is based on the objective factors and living experience that attract talents, and puts the stress on the better service for talents, which helps to find the strong points and shortcomings in the global ecology of urban talents, and cater to the urban administrators who need to revolutionize their talent work philosophy.

The 2021 Report of City Talent Retention Index included another 20 benchmark cities and provided an objective evaluation of the talent retention capacity in 50 cities in the world. The index system was designed based on the definition of talent retention and acquisition, and included some minor adjustments to the previous version. The integrative and continuous index system will help us get a clearer understanding of this concept. We also welcome the talents in the city and other stakeholders to deeply engage in the report and provide the data relating to perception and experience.

We hope this report will help the urban administrators find the weak links in the talent attracting and retention to determine the goals of urban construction in the future and update the philosophy in the talent work, and thereby realize our shared aspiration, which aims to stimulate various city talents' vitality to the fullest extent.

## 01 | The City Talent Retention

### ■ Definition of City Talent Retention

**City Talent Retention refers to a city's ability to attract talents, which reflects the affinity between the city and talents.** A high level of talent retention indicates the talents' sense of identity and dependence on the city, with which the talents will have their sense of gain and achievement when working and living in the city. It suggests that the city provides the talents with sense of safety and belonging.

### ■ Features of the City Talent Retention

**There are two features in the city talent retention:**

First, the city has its internal affinity that makes the local talents willing to stay here for working and living.

Second, the city has its external attraction that can attract numerous talents to work or start their business in the city.

**The city talent retention originates from the accumulation in three respects:**

First, the innovative atmosphere and economic growth of a city mainly depend on the innovative sci-tech enterprises such as unicorn companies emerging from tremendous R&D investment as well as the fortune accumulated from the new technologies, scenarios, models and industries facilitated by such enterprises.

Second, it depends on the assembly effect of the urban supporting facilities of software and hardware, including the cultural resource, medical care and ecological environment.

Third, it depends on the urban residents' perception and evaluation on the life in the city, including its public security, housing burden, traffic convenience and living costs.

The report included such objective factors as urban economic environment, innovation potential, cultural openness, ecological environment, social welfare and public life into the list of city talent retention. The index can intuitively and realistically reflect a city's ecology of talents, which is advantageous in two respects: on the one hand, it is more feasible to explore the strong points and shortcomings in the city's ecology of talents so that the urban administrators can make corresponding policies to the outcome provided by the report's evaluation, which is worthy of reference. On the other hand, it helps to update and transform the philosophy in the urban talent work, manifest the city's care for talents, and accelerate the administrators' functional transformation from administration to service.



## 02 | Index System and Benchmark Cities

In terms of the city talent retention's definition, the report set its indicators from six perspectives, i.e., **economic, innovation, culture, environment, social welfare and life burden**, and each indicators involved several sub-indicators, thus constituting an index system to evaluate the city talent retention. The first-class indicators remained unchanged in comparison with those in 2020, and some sub-indicators were adjusted to maintain the continuity. The adjustments are as follows: the Economic Sustainability in the part of "Economic" was substituted with Labor Productivity; the Level of Education Expenditure in the part of "Culture" was included in "Social Welfare", with the City Connectivity added; the Monthly Income and Insurance Density were added in "Social Welfare"; the Rent Burden and Housing Affordability Index in the part of "Life Burden" were combined as the Housing Burden.

### ■ Indicators

The report's evaluation dimensions and logical structure are as shown in Figure 2-1, which adopts the **economic, innovation, culture, environment, social welfare, and life burden** as the six first-tier indicators in the report to make an overall evaluation on the performance of talent retention in 50 cities across the world.



Figure 2-1 Evaluation dimensions of City Talent Retention

## ■ Sub-Indicators

17 sub-indicators were provided to the six first-tier indicators, which constituted an index system to evaluate the city talent retention; the specific quantitative measurement was conducted through the sub-indicators. The index system and data sources are shown in Table 2-1.

Table 2-1 Pillar profile and data source of City Talent Retention

Pillar	Sub-indicators	Definition	Attribute	Data Source
Economic	VIIRS Nighttime Luminescence	Measures the overall prosperity of a city	+	NPP-VIIRS Nighttime Lights Data
	Labor Productivity	Measures the overall economic strength of a city	+	Statistics And Bulletin of A City
Innovation	R&D Intensity	Measures the overall research ability of a city	+	Statistics And Bulletin of A City
	Number of Unicorn Companies	Measures scientific and technological innovation of a city	+	Such Lists As Cbinsights
Culture	City Connection	Measures the internationalization of a city	+	Varifight
	Foreigner Proportion	Measures the talent internationalization of a city	+	NYC Global City Data
	International Student Proportion	Measures the openness of a city	+	World Cities Culture Forum
Environment	Climate Index	An estimation of climate livability of a given city	+	Numbeo Database
	Pollution Index	An estimation of the overall pollution in a city	-	Numbeo Database
Social Welfare	Monthly Income	Measures residents' income level in a city	+	Numbeo Database
	Government Education Expenditure	Measures residents' income level in a city	+	City Financial Budget
	Physician Density	Measures medical level in a city	+	City Official Survey
	Insurance Density	Measures the level of social security in a city	+	City Statistics
Life Burden	Housing Burden	Measures the level of housing affordability in a city	-	Numbeo Database
	Living Cost Index	A relative indicator of consumer goods prices, including groceries, restaurants, transportation and utilities	+	Numbeo Database
	Commuting Time	Measures the cost of commuting time of urban residents	-	Numbeo Database
	Safety Index	Measures the level of safety in a city	+	Numbeo Database

## ■ Indicator Explanation

### Economic

#### ■ VIIRS Nighttime Light Data

The talent flow and urban prosperity are in a highly positive correlation; the more prosperous a city is, the more attractive it will be for the talents. The nighttime light data is adopted as the proxy variable and an important index of local economic scale to reflect the city's economic development comprehensively.

#### ■ Labor Productivity

The growing economy in a city can continuously enhance the introduction and gathering of talents. The labor productivity and economic development are in a significantly positive correlation; the higher a city's labor productivity is and the more efficient its talent multiplier is, the quicker its economic development will be.

### Innovation

#### ■ R&D Intensity

Sci-tech development in a city is an important index to attract talents. More R&D investment suggests that the talents' innovative activities can get more financial support, which marks the high validity of the sci-tech innovation in the city.

#### ■ Number of Unicorn Companies

The unicorn companies refer to those that were established recently (no more than 10 years) with a market valuation more than 1 billion US dollars. The number of unicorn companies in a city reflects the local talents' innovation potential. The higher number of unicorn companies in a city suggests a denser agglomeration of innovative talents and a more active entrepreneurship environment. The index is adopted in the report to reflect a city's innovation potential.

### Culture

#### ■ City Connectivity

City connectivity and globalization are in a highly positive correlation. A higher city connectivity indicates that it has more frequent communication with the other cities in the world and freer cross-border trade and personnel flow. Therefore, people who come here to study, work or live, can have a more convenient life. The city urban connectivity is weighted by the number of international airlines and connected cities.

#### ■ Foreigner Proportion

The key point of cosmopolitan construction lies in the construction of world-class talent pool. The proportion of foreign residents in local resident population is an epitome of a city's globalization and an important index of its talent retention.

#### ■ International Student Proportion

The number of foreign students can reflect a city's openness, which is a significant index for its reserve of international talents. The growing number of foreign students in a city suggests its improving attraction for the international talents.

## Environment

### ■ Pollution Index

A city's ecological quality is intimately correlated with talents' experience. A healthy urban ecology can provide a good environment for the talents' working and living, which can help introduce more talents. Pollution index is an important index of a city's ecological quality. The higher a city's pollution index is, the more difficult its introduction of talents will be.

### ■ Climatic Index

The climatic index reflects a city's climatic livability. A good climatic condition can help the city attract more talents and form an assembly effect.

## Social Welfare

### ■ Monthly Income

Income is the most substantial index of residents' living standard and an important factor considered by the talents before they enter a city. Especially in large cities, the monthly income is directly correlated with talents' fortune accumulation.

### ■ Government Education Expenditure

The public educational investment manifests the urban administrators' emphasis on education, which can reflect a city's supporting intensity for the talent development, research outcome transformation, etc. The educational investment, i.e., the proportion of public educational expenditure in fiscal expenditure, is adopted as an index to reflect such factor.

### ■ Physician Density

The physician density is an important component of social welfare and a significant index of a city's medical service, which reflects the city's soft strength. A city without a high level of physician density can't provide adequate public medical service to talents.

### ■ Insurance Density

The insurance density reflects local insurance development measured by per capita income of insurance premium. The talents' health and wealth can be protected sufficiently in the area rich in insurance business resources. A higher insurance density indicates that the city's comprehensive insurance service is more developed, which improves the probability for the talents to get the protection from insurance, and thereby attracts more talents.

## Life Burden

### ■ Housing Burden

The extremely high rent and house-purchase costs will directly increase the housing burden for urban talents, and thereby affect a city's attraction for the talents. The housing burden is adopted as the index of the talents' renting or house-purchase burden in a city. A less housing burden suggests that the talents bear less burden in "housing" and higher satisfaction with the city.

### ■ Living Cost Index

The lower living costs is intimately correlated with the higher living satisfaction. The living cost index involves the talents' "food", "clothes", "household" and other daily consumption, which is an important factor affecting the agglomeration of talents.

### ■ Commuting Time

The schedule and expense of urban commuting as well as the convenience of public transport facilities affect the talents' comfort and happiness to some extent. Therefore, the commuting index is adopted as an index of the urban residents' convenience in "transportation".

### ■ Safety Index

The overall levels of public safety usually influence talents' perception of safety and stability of a city so that it plays an important role in talent retention.



## Benchmark Cities

**The report selected the benchmark cities based on the standards as follows:**

**The first standard is the typicality of domestic and overseas cities.** To manifest the ranking of talent retention of the cities across the world in an objective manner, the report mainly selected its objects among top international cities with better talent competitiveness, economic strength, innovation vitality, etc. in the US, Japan, Singapore, Europe, etc., in combination with the first-tier cities, new-first-tier cities, provincial capitals and sub-provincial cities in China.

**The second standard is the continuity in the city choice.** There were 20 overseas and domestic cities added when keeping 30 benchmark cities in the 2020 Report.

**Based on the two standards above,** the report selected 50 cities in the world as the evaluation objects in expectation to reflect the cities' ranking in their capability of attracting and retaining talents objectively and accurately. The benchmark cities selected are as shown in Table 2-2, including 23 domestic cities and 27 overseas cities.<sup>①</sup>

<sup>①</sup> The study of globalization and world cities (GaWC) divided the cities into the grades of Alpha, Beta, Gamma, Sufficiency, etc., of which Alpha++ refers to the most integrative cities; Alpha+ refers to the cities ranking second to those of Alpha++, most of which can meet the need of advanced service in the Asian-Pacific region. Alpha & Alpha- refer to the important cities in the world, which connect the renowned economic regions with the world. Beta cities play some parts in connecting the regions where they locate with the global economy. Gamma cities connect small regions with the global economy. Sufficiency cities have not yet been listed among the world-class cities, though they can provide adequate self-sufficient service.

Table 2-2 The benchmark cities

Number	City	Ranking	Country	Number	City	Ranking	Country
1	Beijing	Alpha +	China	26	Los Angeles	Alpha	United States
2	Shanghai	Alpha +	China	27	Chicago	Alpha	United States
3	Guangzhou	Alpha-	China	28	San Francisco	Alpha-	United States
4	Shenzhen	Alpha-	China	29	Washington DC	Beta+	United States
5	Chendu	Beta+	China	30	Toronto	Alpha	Canada
6	Hangzhou	Beta	China	31	Sydney	Alpha	Australia
7	Nanjing	Beta	China	32	Singapore	Alpha +	Singapore
8	Chongqing	Beta	China	33	Tokyo	Alpha +	Japan
9	Tianjin	Beta	China	34	Seoul	Alpha-	South Korea
10	Wuhan	Beta-	China	35	Moscow	Alpha	Russia
11	Xiamen	Beta-	China	36	Paris	Alpha +	France
12	Shenyang	Beta-	China	37	Frankfurt	Alpha	Germany
13	Xi' an	Beta-	China	38	Berlin	Beta+	Germany
14	Jinan	Beta-	China	39	Stockholm	Alpha-	Sweden
15	Zhengzhou	Beta-	China	40	Amsterdam	Alpha	Netherlands
16	Changsha	Beta-	China	41	Milan	Alpha	Italy
17	Hefei	Gamma+	China	42	Madrid	Alpha	Spain
18	Qingdao	Gamma+	China	43	Barcelona	Beta+	Spain
19	Haikou	Gamma	China	44	Brussel	Alpha	Belgium
20	Harbin	Gamma-	China	45	Helsinki	Beta	Finland
21	Changchun	Sufficiency	China	46	Zurich	Alpha	Switzerland
22	Shijiazhuang	Sufficiency	China	47	Vienna	Alpha-	Austria
23	Hong Kong	Alpha +	China	48	Copenhagen	Beta+	Denmark
24	London	Alpha ++	United Kingdom	49	Oslo	Beta	Norway
25	New York	Alpha ++	United States	50	Sao Paulo	Alpha	Brazil

## 03 | Global City Talent Retention Ranking Analysis

### ■ Global City Talent Retention Ranking Analysis

In order to show the rankings of the 50 benchmark cities and their scores in six pillars in detail, we have drawn a cumulative bar chart, as shown in Figure 3-1.



Over the whole spectrum, we can see a gap between Chinese cities and most overseas cities. The overall performance of foreign cities is above the middle level. Cities in China ranked relatively lower, except for Beijing and Shanghai.

In the global ranking, New York(100.00) takes the top of the list, followed by a few of world-class cities such as London(93.64), Los Angeles(89.64), Chicago(89.63) and Zurich (88.24).

According to the city talent retention index of Chinese cities, Beijing scores 80.92, ranking 7th in the world, and the overall score remains high; Shanghai scores 74.92, ranking 16th in the world; Shenzhen followed closely with a score of 73.66, with the rank of 19. In addition, Hangzhou, Guangzhou, Nanjing and other cities enter the top 30.

Table 3-1 Talent Retention Index list of 50 global cities

City	Ranking	Total Score	Country	City	Ranking	Total Score	Country
New York	1	100.00	United States	Guangzhou	26	67.51	China
London	2	93.64	United Kingdom	Milan	27	66.98	Italy
San Francisco	3	89.63	United States	Amsterdam	28	66.60	Netherlands
Chicago	4	89.64	United States	Moscow	29	65.91	Russia
Zurich	5	88.24	Switzerland	Nanjing	30	65.05	China
Washington DC	6	83.75	United States	Hong Kong	31	65.03	China
Beijing	7	80.92	China	Xi' an	32	63.37	China
Paris	8	80.46	France	Chengdu	33	63.32	China
Los Angeles	9	80.19	United States	Madrid	34	62.80	Spain
Toronto	10	78.65	Canada	Tianjin	35	61.95	China
Berlin	11	77.01	Germany	Qingdao	36	61.81	China
Singapore	12	76.62	Singapore	Barcelona	37	59.24	Spain
Copenhagen	13	75.38	Denmark	Sao Paulo	38	57.10	Brazil
Stockholm	14	75.23	Sweden	Wuhan	39	56.95	China
Seoul	15	75.23	South Korea	Changsha	40	55.85	China
Shanghai	16	74.92	China	Jinan	41	55.70	China
Sydney	17	74.03	Australia	Xiamen	42	55.37	China
Tokyo	18	73.81	Japan	Hefei	43	54.65	China
Shenzhen	19	73.66	China	Chongqing	44	53.57	China
Brussel	20	73.60	Belgium	Shenyang	45	52.57	China
Vienna	21	73.51	Austria	Zhengzhou	46	52.43	China
Oslo	22	70.88	Norway	Changchun	47	52.01	China
Hangzhou	23	70.51	China	Haikou	48	51.78	China
Frankfurt	24	69.60	Germany	Shijiazhuang	49	51.48	China
Helsinki	25	67.87	Finland	Harbin	50	50.00	China

Figure 3-1 50 cities talent retention pillars score

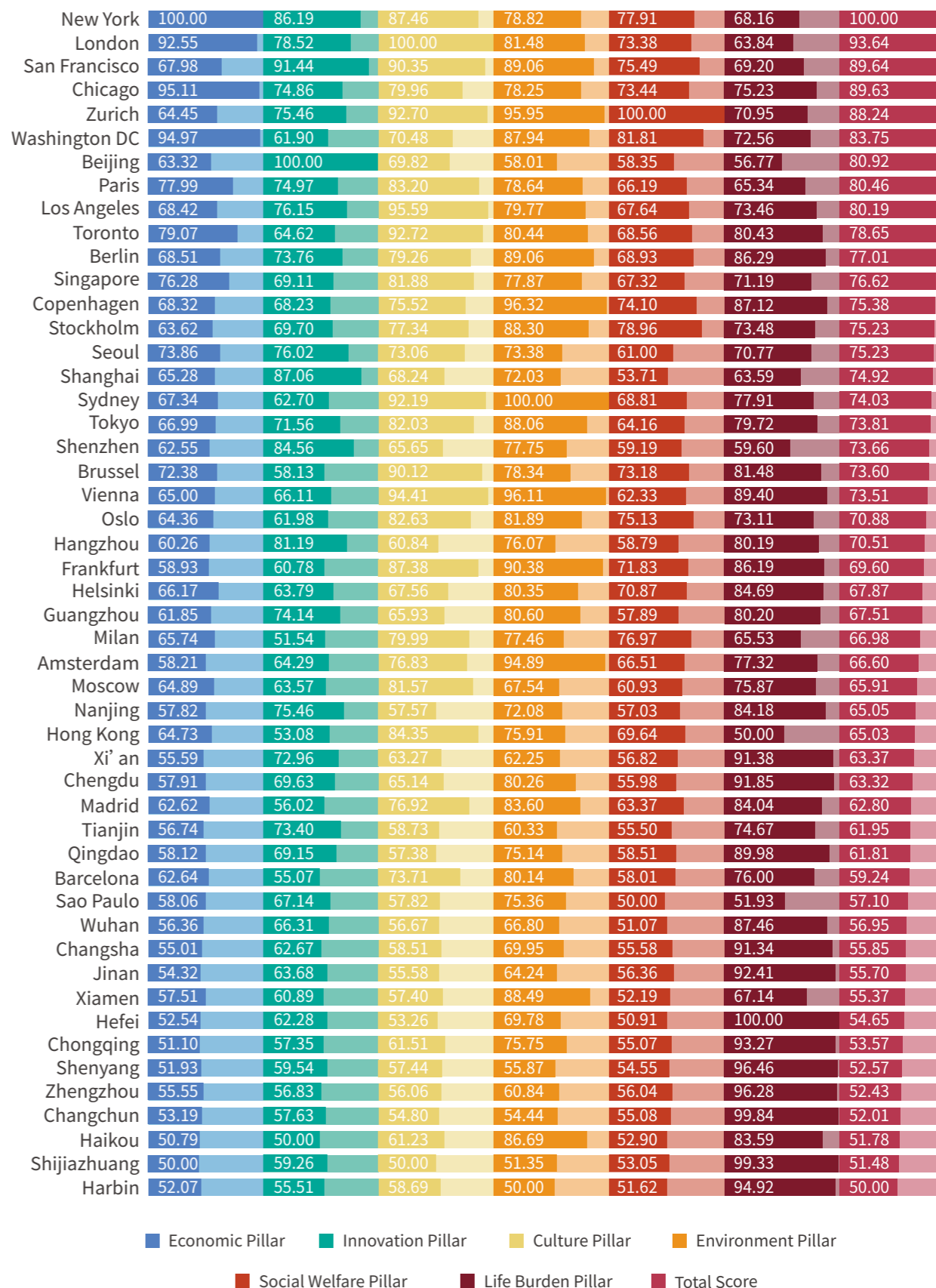




Figure 3-2 gives an overview of the talent retention index of 50 global cities. The radar charts of six pillars' ranking are showed for the top 10 cities. In clockwise order, respectively, the poles stand for Economic, Innovation, Culture, Environment, Social Welfare, and Life Burden. On the whole, New York and London are placed at the top of the list, with 5 US cities and 3 European cities entering the top 10. Among Chinese cities, Beijing is the only city in the front, ranking 7th.

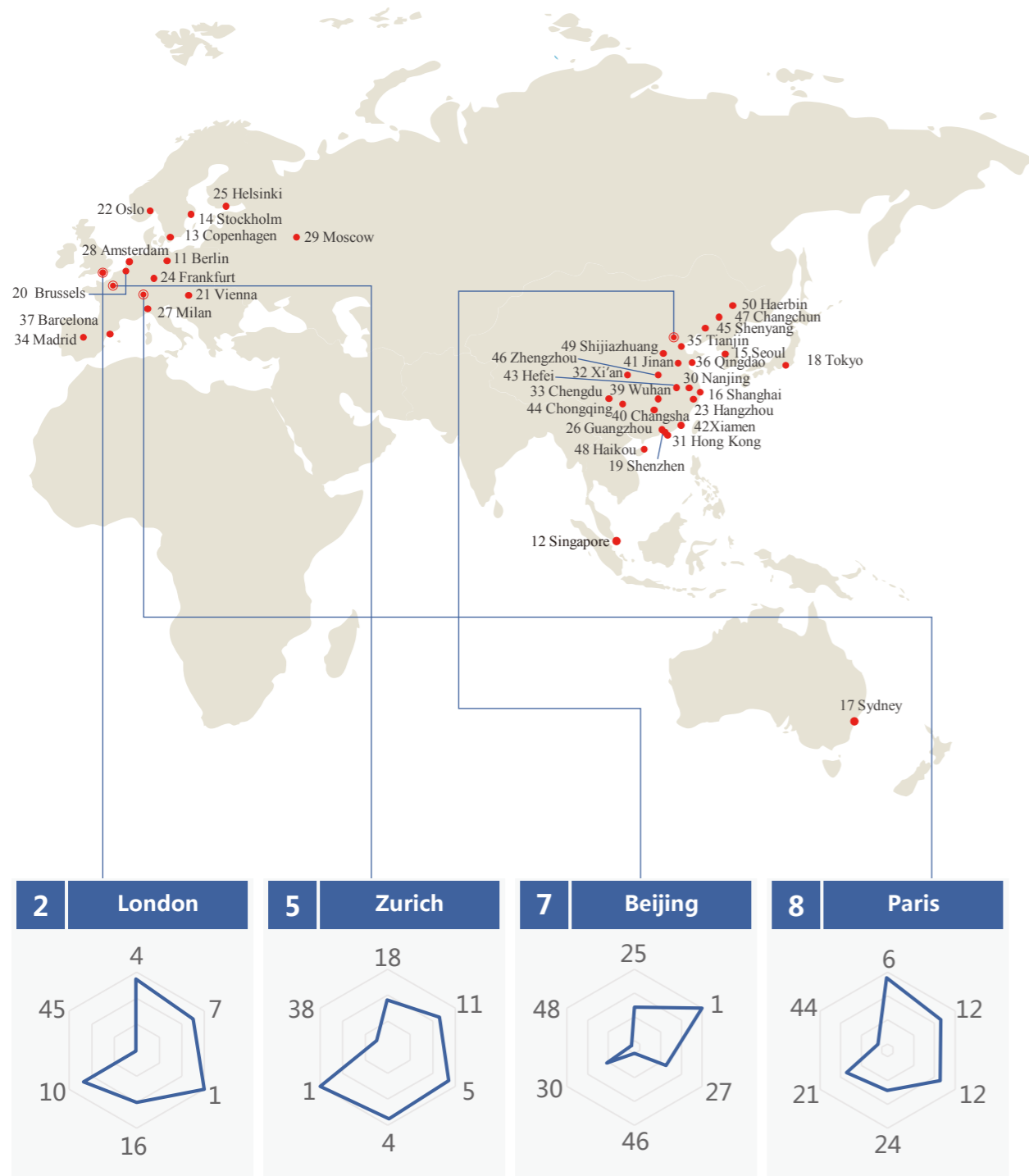


Figure 3-2-1 Overview of Global City Talent Retention

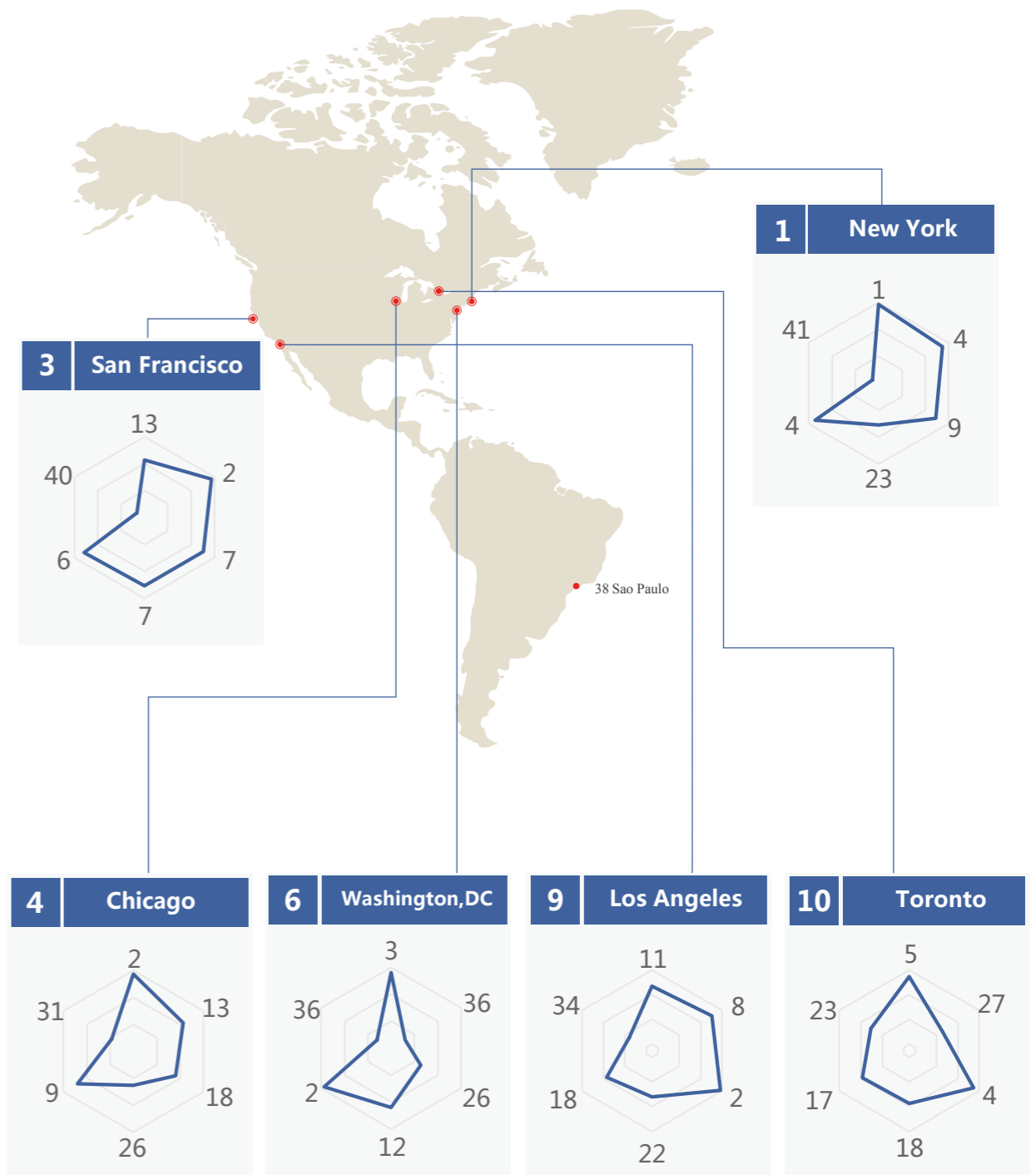


Figure 3-2-2 Overview of Global City Talent Retention



The radar charts of six pillars in domestic cities are shown in Figure 3-3. In clockwise order, respectively, poles stand for the city ranks of Economic, Innovation, Culture, Environment, Social Welfare, and Life Burden. The results indicate that, Nanjing, Hangzhou, and Qingdao achieve well-balanced development in all six pillars of talent retention, while the remaining cities have apparent shortcomings. For example, high housing prices and price index in Beijing, Shanghai, Shenzhen and Hong Kong have led to their poor rankings in Life Burden Pillar; Chongqing, Chengdu, Wuhan, and Xiamen have inadequate medical resources as well as incomplete social security; Although Harbin, Changchun, Shenyang and Hefei have advantages in the life burden, thanks to low living costs, there is still a big gap compared with other cities in terms of other pillars, resulting in a lower level of city talent retention.

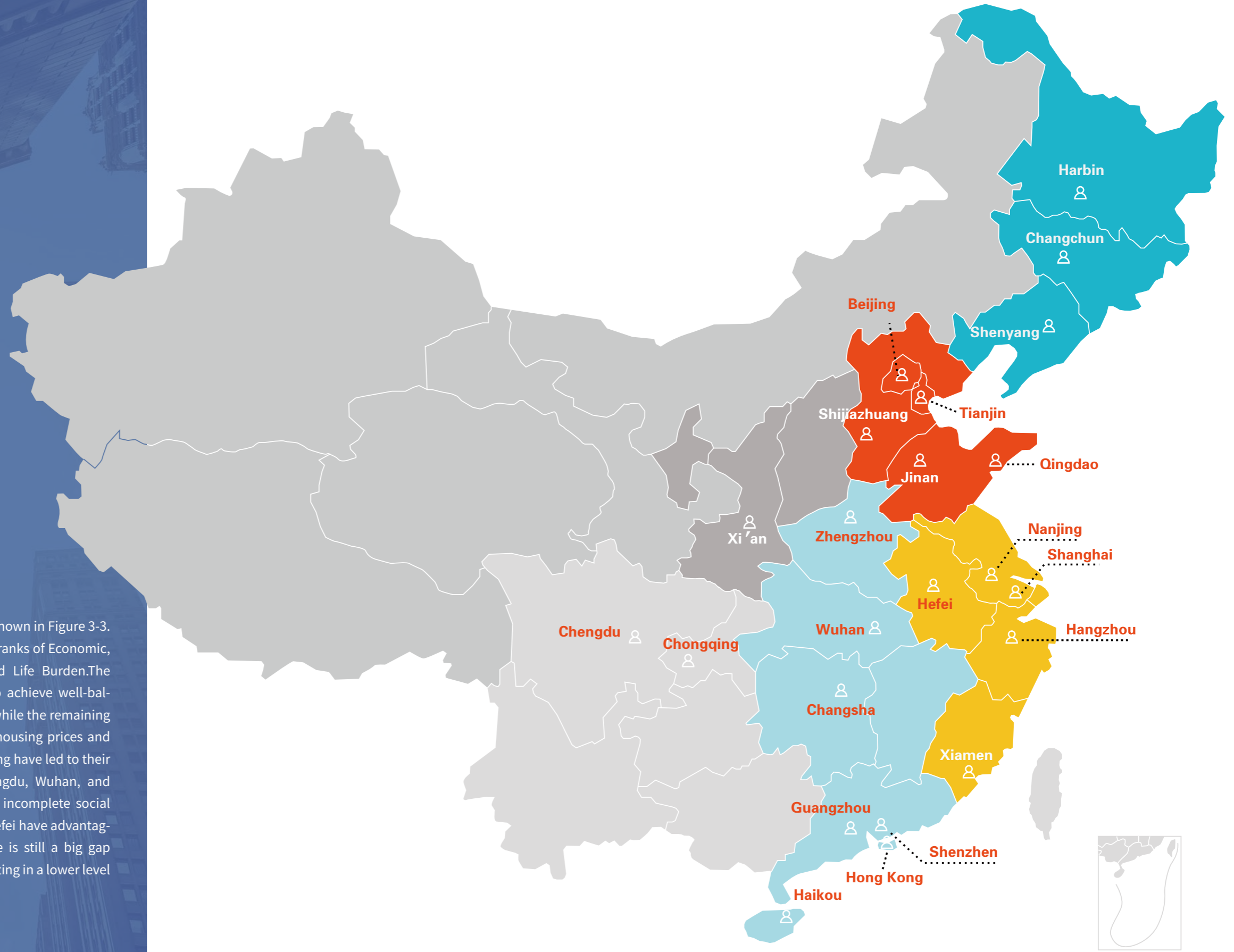
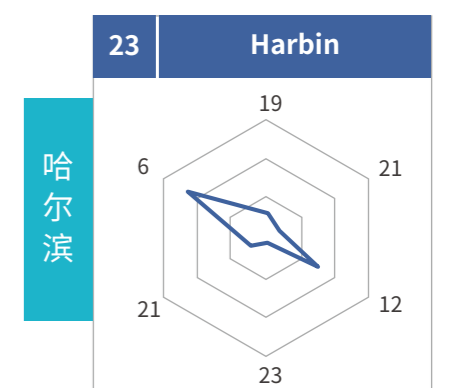
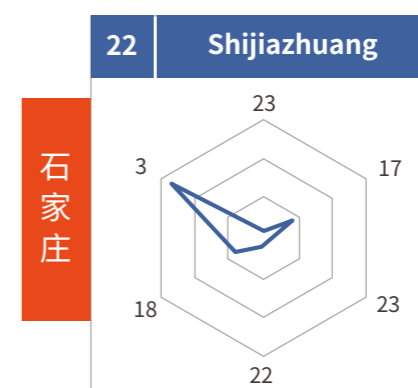
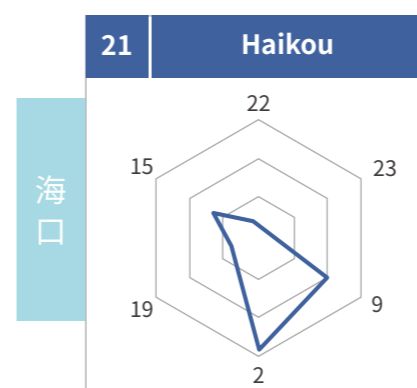
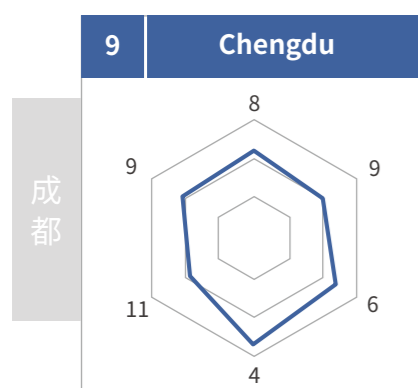
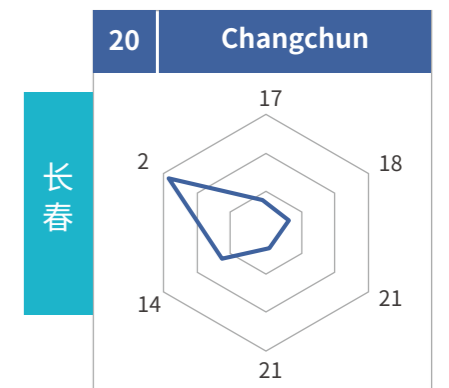
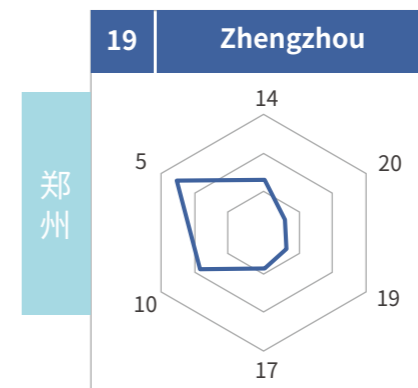
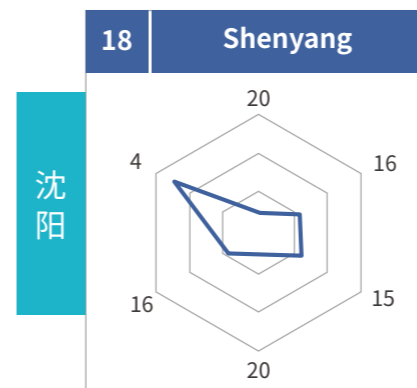
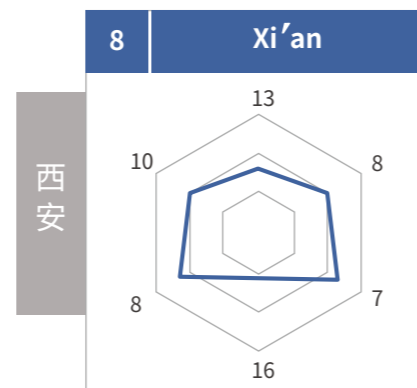
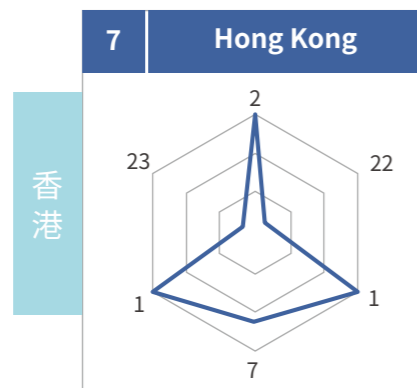
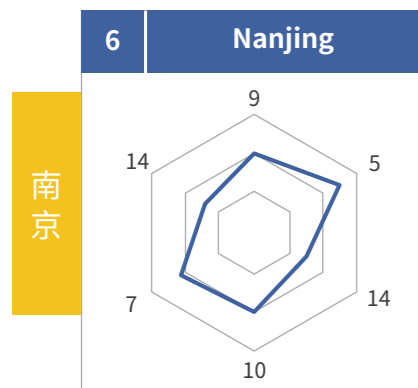
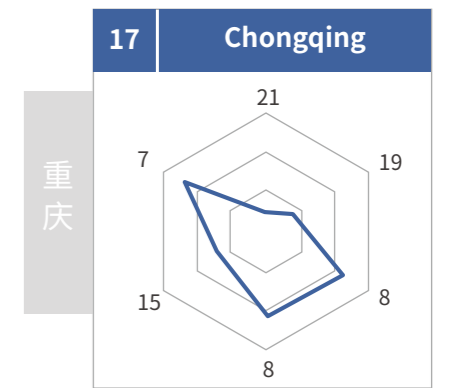
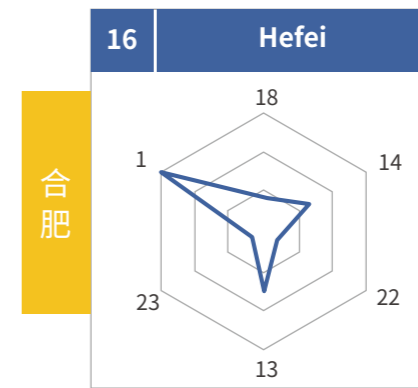
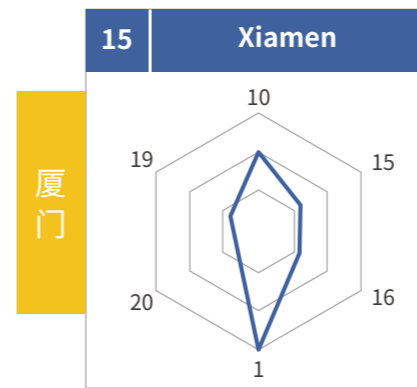
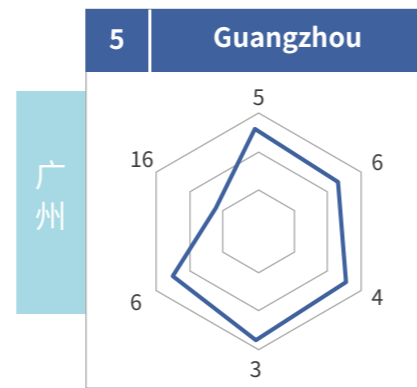
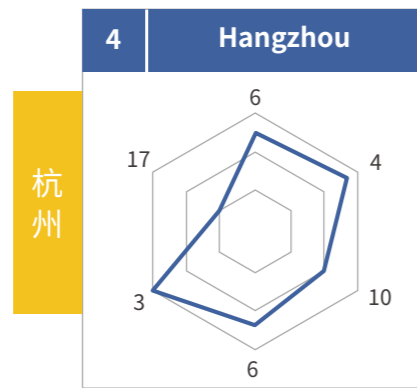
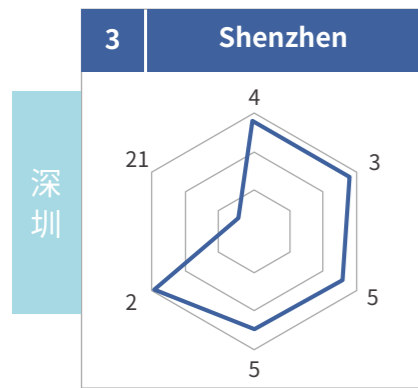
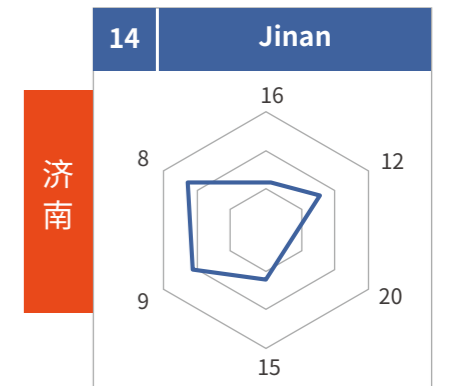
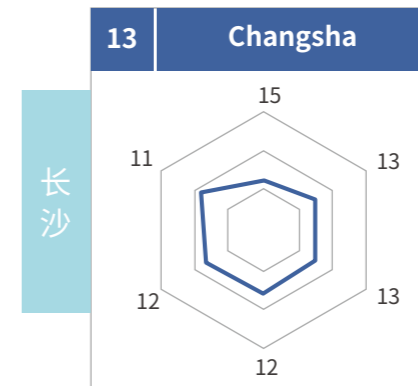
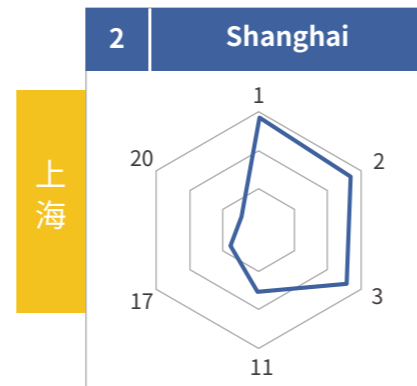
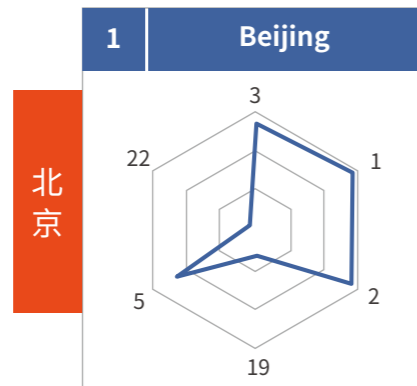
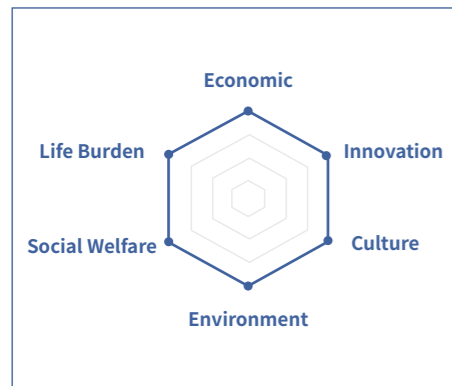


Figure 3-3 Domestic cities' radar charts



## ■ Multidimensional Analysis of the City Talent Retention

In this session, we analyze the performance of top 10 cities in each pillar, as well as the situation in Beijing.

### 1. Economic Pillar Ranking

Economic Pillar contains VIIRS nighttime light data and labor productivity as two sub-indicators. As shown in Figure 3-4, the cities in the first-tier are New York (100.00), Chicago (95.11), Washington (94.97) and London (92.55). Compared with the second-tier cities whose score is less than 80, cities in the first-tier have a greater lead. The top 10 list includes 8 European and U.S. cities as well as Singapore and Seoul in Asia. Beijing's score in Economic Pillar is 63.32, ranking 25th, lagging behind the overall ranking (7th). In general, city's Economic Pillar is in agreement with the talent retention, and also an important driving factor for the total score of talent retention.

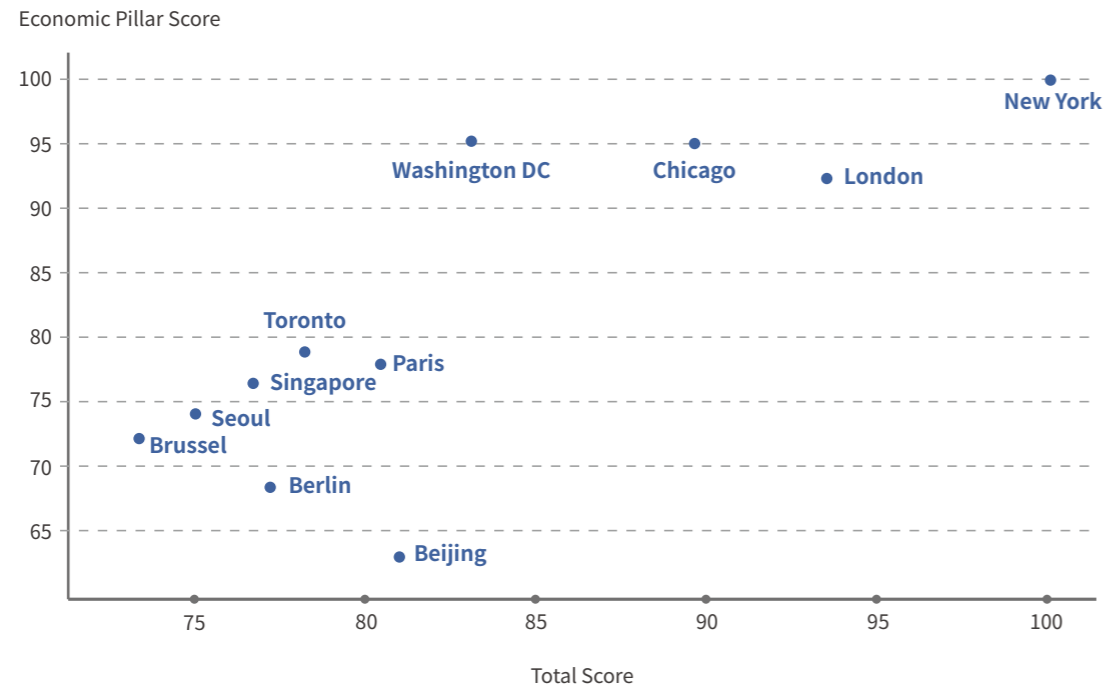


Figure 3-4 Economic Pillar: Foreign cities VS Beijing

### 2. Innovation Pillar Ranking

Innovation Pillar includes two sub-indicators: R&D intensity and the number of unicorn companies. Owing to the world's highest R&D investment intensity and the advantages of agglomeration of unicorn enterprises, Beijing ranks first in this pillar as shown in figure 3-5. Meanwhile, the difference between Beijing(100.00) and the second place San Francisco (91.44) shows that Beijing has a clear advantage in stimulating the innovative vitality of talents. Beijing has always firmly adhered to innovation as the core position in the overall situation of the capital's modernization, and has continuously increased its investment in scientific and technological research and development. In addition, five other Chinese cities manage to enter the top 10 list. Shanghai (87.06) ranks third, Shenzhen (84.56) and Hangzhou (81.19) separately rank fifth and sixth, with Nanjing (75.46) ranks 10th place. Although, for Chinese cities, there is still quite much room to improve compared to world-class cities such as New York, London, San Francisco and Seoul, the innovation potential is outstanding. It is not difficult to see that for Chinese cities at a rapid development stage, the innovation pillar plays a strong role in promoting the retention of talents.

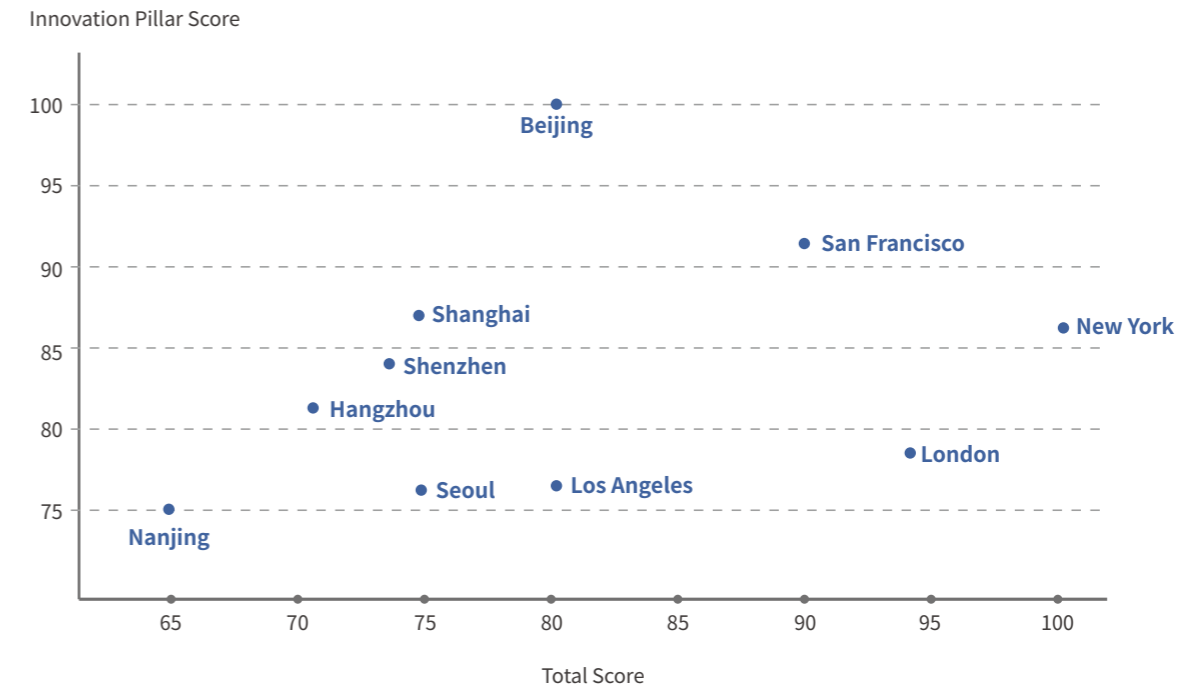


Figure 3-5 Innovation Pillar: Foreign cities VS Beijing

### 3. Culture Pillar Ranking

The score and ranking of Culture Pillar are visible in Figure 3-6. This dimension covers three sub-indicators: foreigner proportion, international students proportion, and city connection. As one of the cultural and economic centers in Europe with the longest history, London has been attracting a large number of outstanding international students come to study and work by its openness and inclusiveness. To be more specific, foreigners account for 35% of the population and the proportion of international students is 31.3%, which both sub-indicators rank first among all 50 cities. The following three positions are occupied by Los Angeles (95.59), Vienna (94.41) and Zurich (92.70). Beijing hits 69.82 in Culture Pillar, ranking 27th, falling behind Hong Kong (84.35) among Chinese cities. It can be seen that the Culture Pillar and talent retention are generally positively correlated.

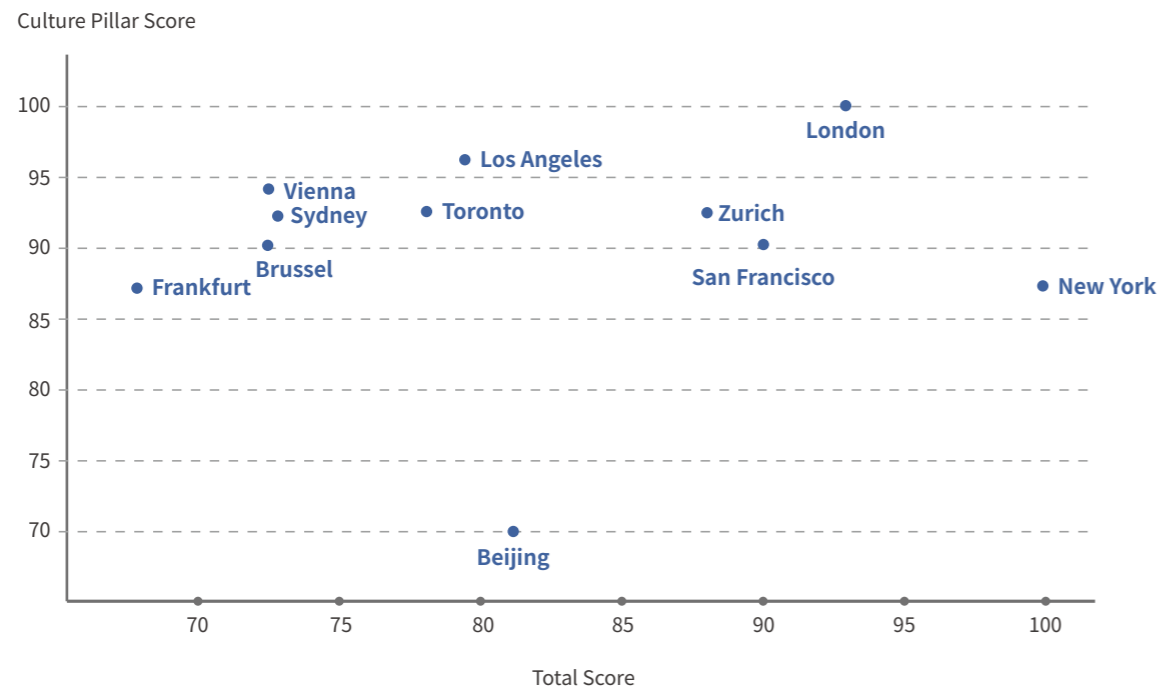


Figure 3-6 Culture Pillar: Foreign cities VS Beijing

### 4. Environment Pillar Ranking

We can observe the Environment Pillar scores and rankings in Figure 3-7. This pillar covers two sub-indicators of pollution and climate index. It should be noted that small temperature fluctuation over seasons and abundant rain and sunshine are the high standard of climate index, thus cities with higher scores possess similar geographic environmental characteristics. With respect to global cities, Sydney ranks first for its pleasant climate and beautiful and livable environment throughout the year, followed by Copenhagen (96.32), Vienna (96.11), and Zurich (95.95). Most of the top 10 cities are in Europe, and cities in southern China such as Xiamen (88.49) and Haikou (86.69) rank 9th and 13th respectively. Beijing (55.13) has a large gap with the top cities due to its climatic disadvantages. On the whole, the advantages of environment play a strong driving part in talent retention scores.

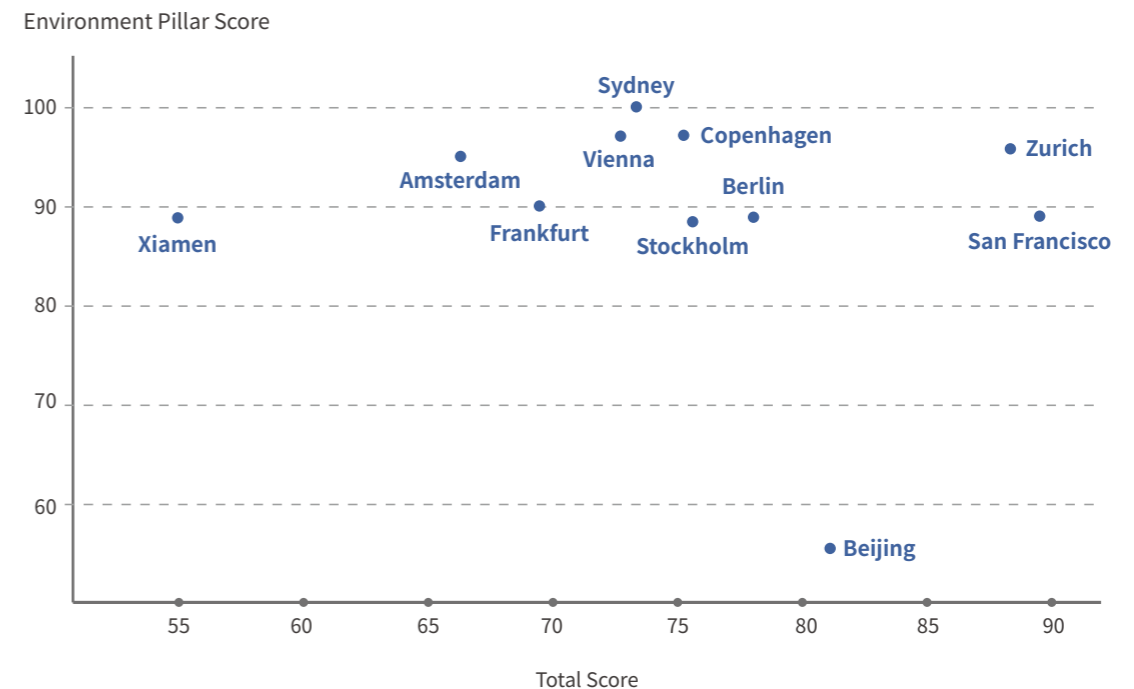


Figure 3-7 Environment Pillar: Foreign cities VS Beijing

### 5. Social Welfare Pillar Ranking

The score and ranking of Social Welfare Pillar are shown in Figure 3-8. This pillar covers four sub-indicators: monthly income, government education expenditure, physician density, and insurance density. With its world-renowned high level of social welfare, Zurich stands out among all cities, far surpassing Washington (81.81), Stockholm (78.96), New York (77.91), and other second-tier cities. With a score of 58.35, Beijing ranks 30th, behind the overall score ranking (7th). It is not difficult to conclude that Beijing still has much room for improving social welfare performance.

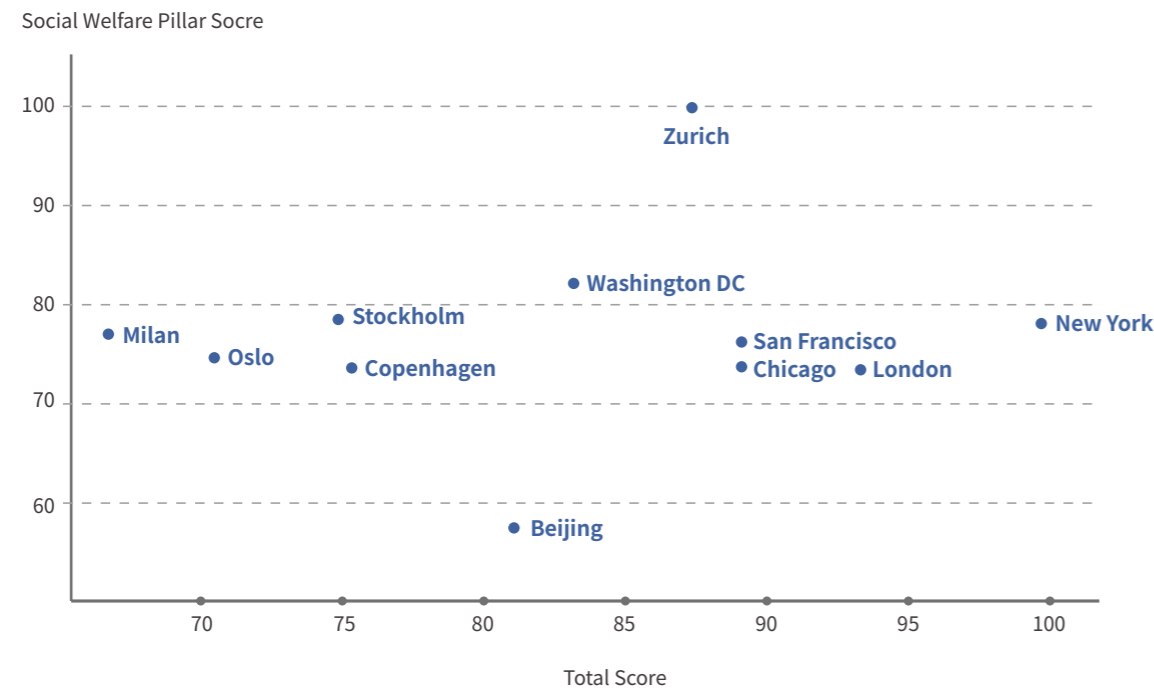


Figure 3-8 Social Welfare Pillar: Foreign cities VS Beijing

### 6. Life Burden Pillar Ranking

The score and ranking of Life Burden Pillar are shown in Figure 3-9. This dimension is a key component to the talent retention, comprising four sub-indicators: housing burden, living cost index, commuting time, and safety index. Among foreign cities, Vienna (89.40) ranks first, followed by Copenhagen (87.12), Berlin (86.29), and Frankfurt (86.19). The top 10 cities score more concentratedly. Beijing achieves only 56.77, as housing burden and commuting index are shortcomings in this regard. Although the weak performance in individual life burden is a common drawback among the top 10 cities in the total list, Beijing ranks quite low (48th) in this pillar, restricting its further enhancement of the total score.

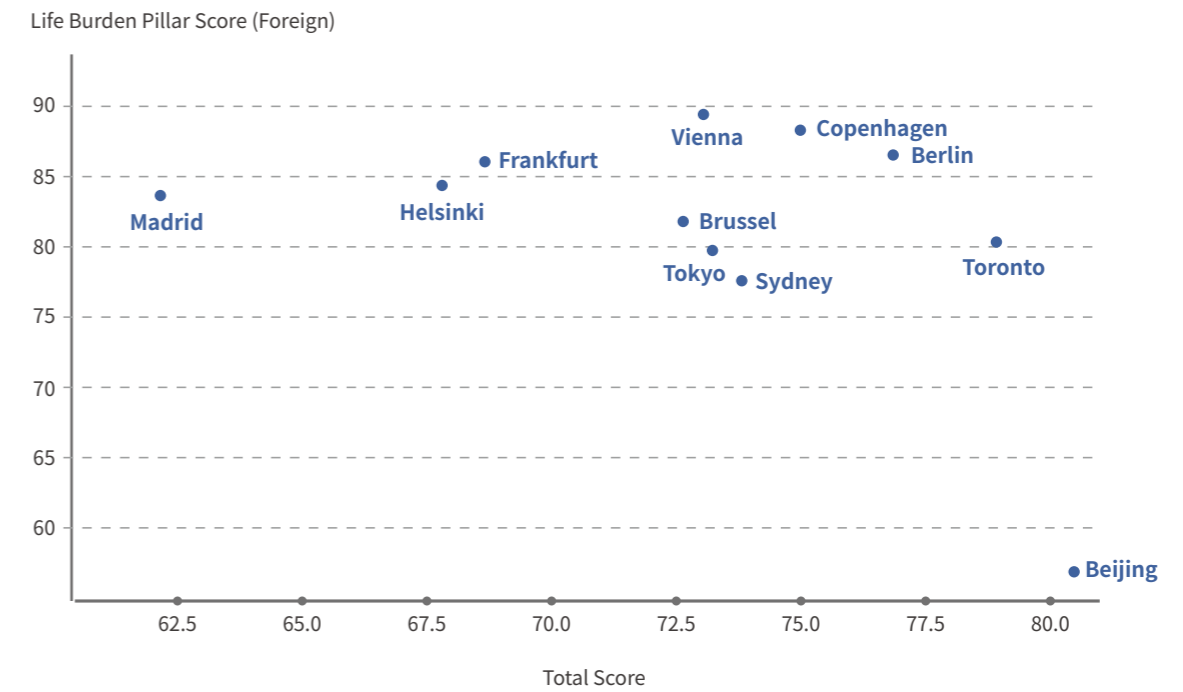


Figure 3-9 Life Burden Pillar: Foreign cities VS Beijing



Among Chinese cities, Hefei (100.00) ranks first in the world with low cost of living and convenient commuting conditions, followed by cities such as Changchun (99.84), Shijiazhuang (99.33), and Shenyang (96.46). In all, domestic cities with outstanding individual life burden performance are unremarkable in other pillars, resulting in a low overall score.

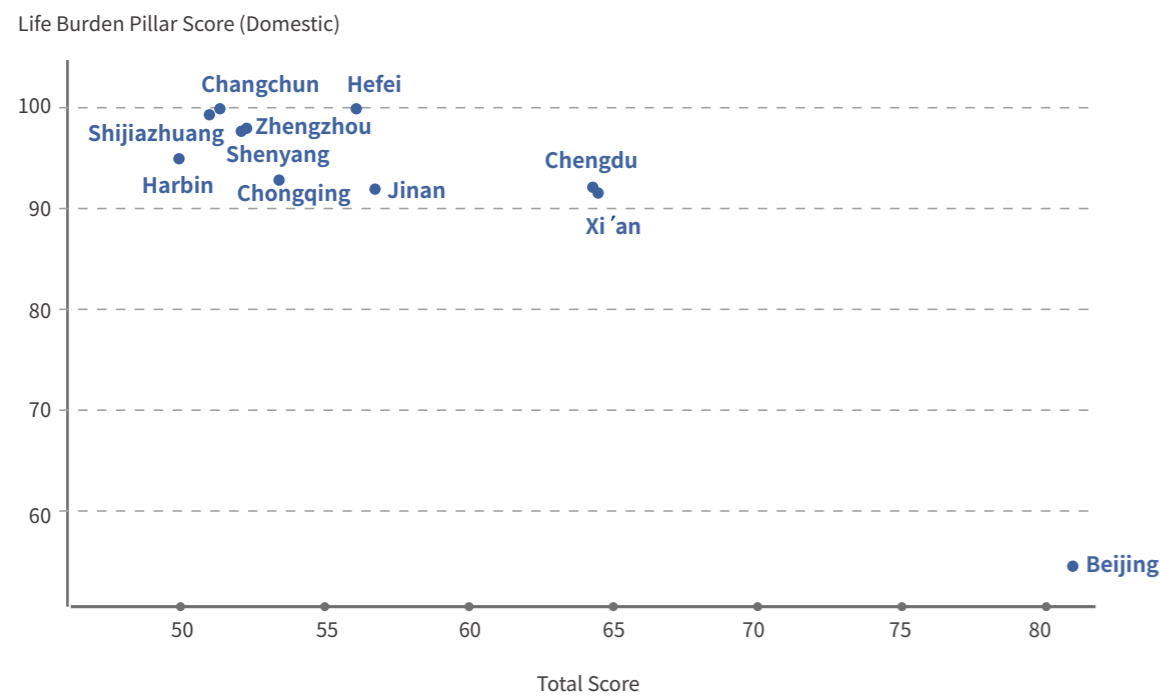


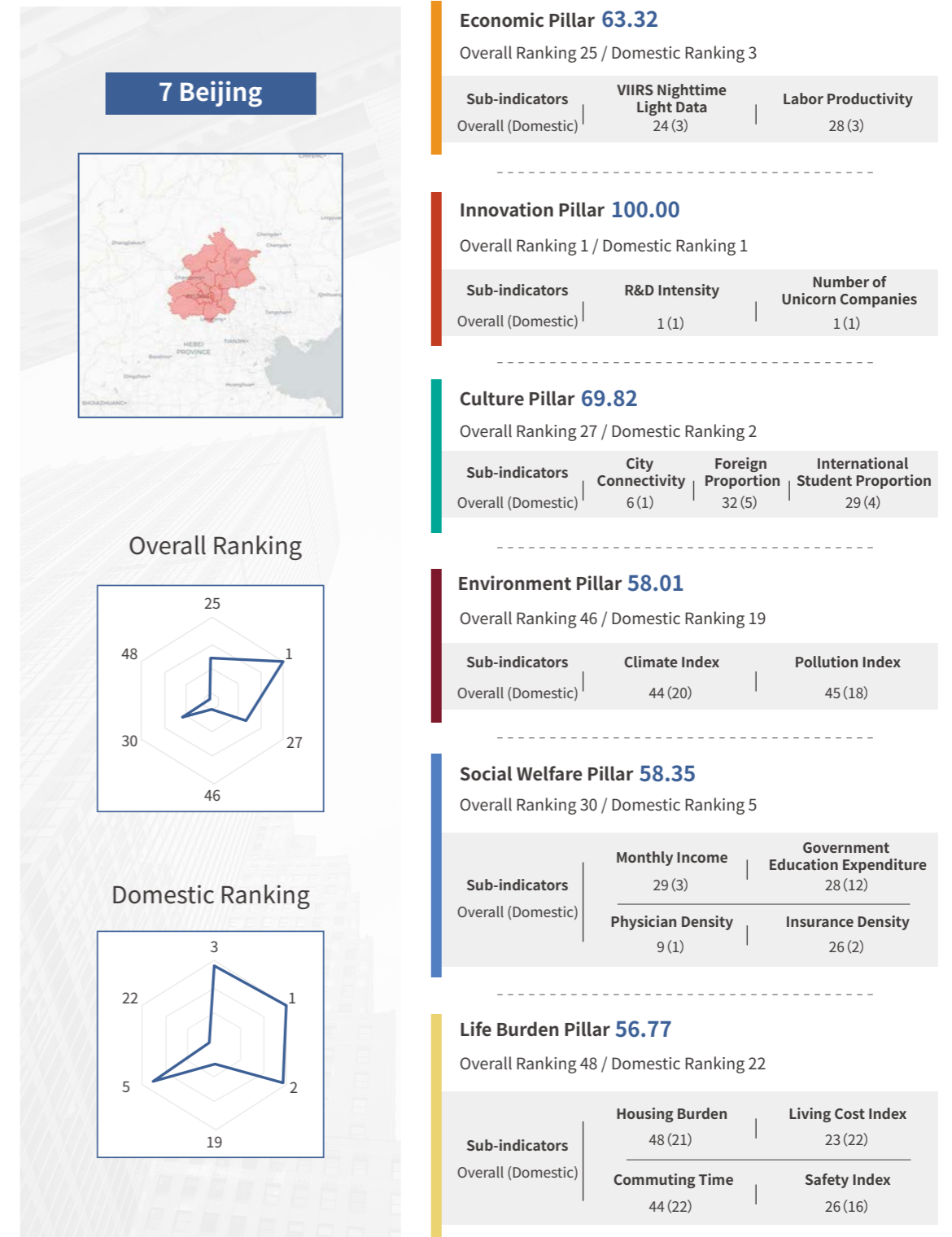
Figure 3-10 Life Burden Pillar: Domestic cities VS Beijing

## 04 | Beijing City Talent Profile

### City Talent Profile Display

We produce following Beijing city talent profile according to rankings of all indicators and radar charts.

Figure 4-1 Beijing city talent profile



Beijing ranks 7th out of 50 cities worldwide in terms of total score, which is one place higher than last year and ranks first in China for two consecutive years.

### ¥ Economic Pillar

**63.32** Overall Ranking 25  
Domestic Ranking 3

Beijing's performance in the two sub-indicators of VIIRS Nighttime Light and labor productivity is at the middle level, and the overall rankings are 24th and 29th respectively, indicating that Beijing remains a certain gap in economic strength among the top world-class cities. We believe that the level of economic development is a basic indicator that would affect the retention of city talents, as well as a concentrated reflection of various elements of the business environment. Although Beijing's GDP is in the top 10 among all the cities, the production efficiency still needs to be further increased.

### 🔬 Innovation Pillar

**100.00** Overall Ranking 1  
Domestic Ranking 1

Diving into the detail, Beijing ranks first among all 50 cities with 82 unicorn companies. Unicorns are mainly distributed in artificial intelligence, new retail, digital entertainment, medical and health industry, which is an important platform for gathering high-level scientific and technological talents at home and abroad. On top of that, Beijing's R&D intensity has showed a steady upward trend. In 2020, Beijing's R&D expenditure accounts for 6.44% of GDP, ranking first in the world. High R&D investment ensures that scientific and technological talents can obtain sufficient and continuous financial support when engaging in research and innovation activities, which also highlights the strategic positioning of establishing the Global Innovation Hubs by 2025. At present, Beijing is accelerating the formation of an innovative structured talent team consisting of strategic scientists, top talents in their fields and young talents, and striving to build an international leading innovation and entrepreneurship ecosystem to fully stimulate talent innovation vitality.

### 🌐 Culture Pillar

**69.82** Overall Ranking 27  
Domestic Ranking 2

As for sub-indicators, city connectivity ranks sixth in the world. Prior to the COVID-19 Pandemic, on the one hand, Beijing Daxing International Airport was put into use. On the other hand, Beijing Capital International Airport admitted 407 international flights on daily basis in average, with more than 75,000 international passengers per day, winning the ACI Airport Service Quality Award for 13 consecutive years. It is foreseeable that, in the near future, the two airports will form an international-level "dual hubs" structure, and provide sufficient convenience for the travel of international talents. However, the proportion of international students (29th) and the proportion of foreigners (32nd) still rank low. The capital possesses a unique cultural charm and many well-known universities. Universities in Beijing are encouraged to cooperate with internationally renowned universities in running schools and establishing high-level and characteristic international student exchange programs, continuously attracting high-quality global talents to Beijing for further study and development. In addition, to meet the needs of international talents, Beijing is constructing a first-class international talent community, focusing on creating a group of overseas-like and multicultural areas, and vigorously attracting high-level foreign talents to come to Beijing to innovate and start businesses. It is promising to forecast that the level of international talents in Beijing will be improved to a certain extent.

### 🌿 Environment Pillar

**58.01** Overall Ranking 46  
Domestic Ranking 19

A beautiful ecological environment can greatly enhance talents' sense of experience in the city and speed up the frequency of talent exchanges. While Beijing only ranks 18th domestically in pollution index, in recent years, Beijing's pollution prevention and control campaign has achieved remarkable results. The ecosystem has been significantly improved. The forest coverage rate has reached 44.4%, and the concentration of fine particles has decreased by 10% annually. The urban pollution prevention and control experience has been included in the "air improvement model" by the United Nations Environment Agency. In February this year, Beijing released the "Action Plan for Pollution Prevention and Control in 2021", which carried out special optimization actions for air, water, and soil pollution in order. We can expect that the quality of city's ecosystem continues to improve. Meanwhile, the progressing Environment Pillars will become a crucial starting point for improving the capital's talent retention.

### 👤 Social Welfare Pillar

**58.35** Overall Ranking 30  
Domestic Ranking 5

In terms of physician density, Beijing has nearly 5 doctors per thousand people, ranking 9th in the world, thanks to Beijing's abundant high-quality medical and health resources. In the process of joint prevention and control of the COVID-19 Pandemic, an expert team composed of medical staff from the capital, as an indispensable professional force, has always been fighting in the front line. This team insists on implementing regular pandemic prevention and control measures, effectively controlling the spread of the pandemic for multiple times, and demonstrating excellent capabilities on public health emergency management. In terms of insurance density, Beijing ranks 26th in the world and 2nd in China. Insurance density is one of the representative characteristics of the level of social welfare, which can increase the probability of city residents acquiring property and healthy living. Compared with the international community, Beijing's insurance industry starts late but has developed rapidly. With the improvement of social security system, the "Beijing Inclusive Health Insurance" was officially launched this year, with a low threshold of 195 yuan per person per year and the insurance coverage up to 3million yuan guarantee. As for monthly income and education expenditure, Beijing is at the middle and lower level, whereas generous salaries and high-quality educational resources are important factors when it comes to attracting talents. In fact, Beijing adheres to giving priority to education development, increasing investment in education year by year. The implementation of policy that aims to "ease the burden of excessive homework and off-campus tutoring for students undergoing compulsory education" in August 2021 fully demonstrates Beijing's determination to consolidate basic education and attach importance to improve the essential-qualities-oriented education.

### ⚙️ Life Burden Pillar

**56.77** Overall Ranking 48  
Domestic Ranking 22

The public life burden is still a major obstacle to Beijing's promotion of talent retention. The weak performance in this pillar attributes to high cost of renting and purchasing real estate (international ranks 48th in housing burden) and the long commute time (international ranks 44th in commuting time). In order to improve Beijing's public life endurance, it is necessary to start from three aspects: increasing average salaries, reducing living costs, and shortening commuting time. In terms of salary and benefits, Beijing still has to focus on exploring common prosperity, increasing the income level of residents through multiple measures, further playing the role of the third distribution, and expanding the middle-income group. The generous salary package will solve the burden of housing and high cost of living to a certain extent, forming a solid foundation for finally enhancing the retention of talents. In terms of living costs, Beijing has begun to actively formulate relevant policies, including tightening bank loans for second-hand housing, combating housing speculation in school districts, increasing the supply of talent apartments, and providing more public rental housing for talents. This series of measures is anticipated to stabilize housing prices as soon as possible and reduce the cost of renting a house. In terms of commuting time, Beijing is accelerating the construction of an efficient and convenient city rail network. In 2021, Beijing is working on projects of 15 subway lines (parts) and 7 new lines (parts), which will be put into service by the end of the year and be expected to enhance commuting efficiency of Beijing residents.

To sum up, the extraordinary innovation potential has become the core competitiveness of Beijing's city talent retention, but the heavy housing and living burden are still the major weakness that cannot afford to be overlooked. Also, we provide city talent profiles of 50 cities in the appendix, comprehensively showing the scores in six pillars and the ranking of sub-indicators in detail.



## ■ Policy Recommendations

**The first is to promote the structure of talent attraction.** It is suggested to harness the development trend of the digital economy, import the targeted most advanced scientists in their domain while not confined to any features such as nationality, gender, and title, with an emphasis on attracting ambitious, sophisticated, capable, and successful engineers from the field of electrical engineering, automation, artificial intelligence, and algorithms. It is also essential to popularize skill education, break the knowledge barriers of “innovation by all”, and improve the whole-society labor productivity.

**The second is to strengthen the system of the “Government-Industry-University-Research-Application” system.** It is suggested to connect the demand of innovational entrepreneurs and small and medium-sized enterprises with the supply of scientific research results from research universities and institutions to release the efficacy of research achievements and stimulate startups’ potential. We should also focus on the government’s first-set and procurement policies, prioritize the procurement of innovative products and services of small and medium-sized enterprises, and provide application scenarios for enterprises to promote the commercialization of their cutting-edge technologies. It is needed to encourage students to have an internship in startups and provide the “soil” to cultivate strength for enterprises to attract talents.

**The third is to broaden the talent evaluation approaches.** It is suggested to establish a talent-referral committee, design flexible identification methods for talent introduction, and provide professional consultation for Beijing to accurately introduce urgently needed talents. We should navigate employers to adopt correct values of selecting and using talents, not taking “famous universities” as the main standards, comprehensively evaluate talents’ current capability and development potential, and earnestly solve the difficult problem of “the high-level consumption of talents”.

**The fourth is to provide adequate policy support.** It is suggested to increase the depth of the policy service system around precise talent introduction, entrepreneurship support, and life security. Using strategies like “one enterprise, one policy” and deductions on taxes and fees to enhance financial can help to support small and medium-sized enterprises to develop into “new, distinctive, specialized, and sophisticated” small giants and unicorn enterprises so that one must see fragrant plants every ten steps in place of origin for innovation and creation. It is also necessary to use “one person, one policy” strategy to track service and import global high-level talents and teams, periodically harness the demands of high-level overseas talents, and implement interim evaluation and dynamic optimization for talent policies.

**The fifth is to elaborate on the “logistic” services.** To make talents willing to stay in the city, we should pay close attention to their satisfaction with public life while constructing an excellent urban ecological environment. Also, we should solve the housing problem of talents through coordination, lower the cost of renting and purchasing houses, and provide housing support for talents. Meanwhile, optimizing the layout of urban rail transit and promoting the balance between work and residence are also vital. In terms of the ecological environment, objective indicators such as PM2.5 concentration should be integrated with residents’ satisfaction for comprehensive evaluation. The major responsibility for garbage classification shall be orderly transferred from government surveillance to public participation. Social governance shall be transferred from “Response and Act Immediately Whenever Complaint Received” to Regional Collaborative Governance to create a harmonious and livable living ecological environment for talents.

**The sixth is to consolidate the digital transition.** It is needed to construct a comprehensive talent recruitment platform by relying on the digital models for dynamic talents’ diathesis to accomplish the digitalization and precision of talent recruit-

ment. It is suggested to construct service platforms for overseas talent information and realize the precise and timely pushes of policy consultation and meticulous intelligence application of information data. Also, we should build online learning platforms to support the case study and curriculum of advanced technology and management experience to give full play to share the role of “gold medal lecturer” of top talents.

**The seventh is to promote policy advocacy.** “The fragrance of wine is also afraid of the deep alley”. It is suggested to adhere to the idea of a “media-oriented platform, visualized report, and intelligent communication”, with the help of open platforms such as Zhong guancun Forum, China International Fair for Trade in Services, Financial Street Forum, and HICOOL Global Entrepreneur Summit and Entrepreneurship Competition. We should integrate the monopolistic advantages of the large scale of new media users and high dissemination efficiency with the authoritative depth of traditional media such as fine content and quality control. We promote Beijing's policy of attracting and retaining talents with popular language and wide communication channels.



# OS | Special Series

## Series 1 | Silicon Valley AI Talent Descriptive Analysis



Currently, Silicon Valley is leading the way in attracting, educating and retaining AI top Talent (1%). 20% AI experts work for tech giants (Google, Microsoft, Apple, Amazon, IBM) within Silicon Valley, and 36% U.S. AI experts are employed in Silicon Valley. Silicon Valley has thrived as regions rich in global top AI talent, with 4 defining characteristics: Borderless talent recruitment, at least 3-5 years' experience, high talent density, and a significant net inflow.

### Unlocking AI job requirements

According to Indeed, the annual growth rate of AI job postings in Silicon Valley has slowed down from 136.3% in 2017 to 29.1% in 2020. A structural change occurs in the AI talent demand from massive quantities to more experienced candidates and top-tier university graduates. TalentSeer surveyed more than 80 AI startups in Silicon Valley and proposed 7 key teams to build a robust AI team structure (Table 5-1).

Table 5-1 AI Talent Demand by Team Structure

No.	Team Structure	Talent Demand
1	Algorithm Team	ML/CV/NLP/Robotics/Framework Engineer
2	AI Research Team	ML/CV/NLP Researcher
3	Core Infrastructure Team	Full stack/Backend/Security/DevOps Engineer
4	Data Team	Data Scientist/Engineer
5	Hardware Team	Embedded System Engineer
6	Product Team	Product Manager/Front End Engineer/UX Expert
7	Commercialization Team	Business Dev/Marketing/Legal/Sales

Source: <https://www.talentseer.com/2020-ai-talent-report>

### Untangling the talent magnet myth of Silicon Valley

Here we put forward four reasons why Silicon Valley can be a talent magnet for global elite AI talents.

Silicon Valley stands out as the highest paying market in the world. Figure 5-1 indicates Silicon Valley AI companies offer an average annual payroll up to USD293,000<sup>①</sup>, which is the highest paying salary on the global pay scale. Figure 5-2 shows that Silicon Valley companies offer a diverse compensation package to lure global top-tier AI talents, including base salary, stock, bonus, and sign-on bonus. It is worth mentioning that sign-on bonus is one-time payments given to a new employee, with the purpose of attracting talents to join the company. Growth stage startups typically offer the highest pay, comparable to other types of tech companies. The median base pay for these growth stage startups may even go up to \$350K to win the talent war.

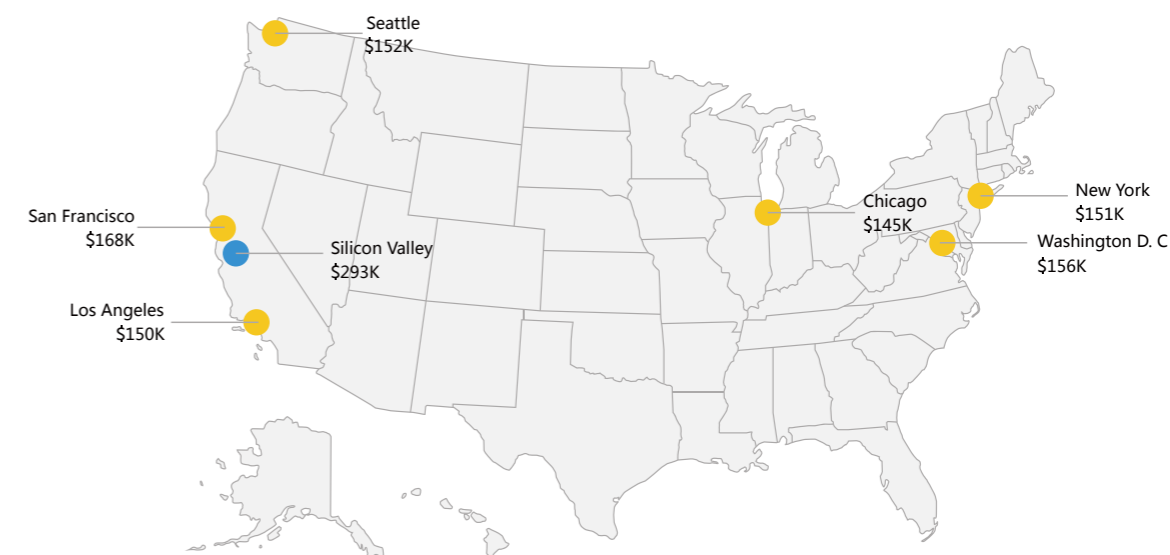


Figure 5-1 Average AI salary in the United States

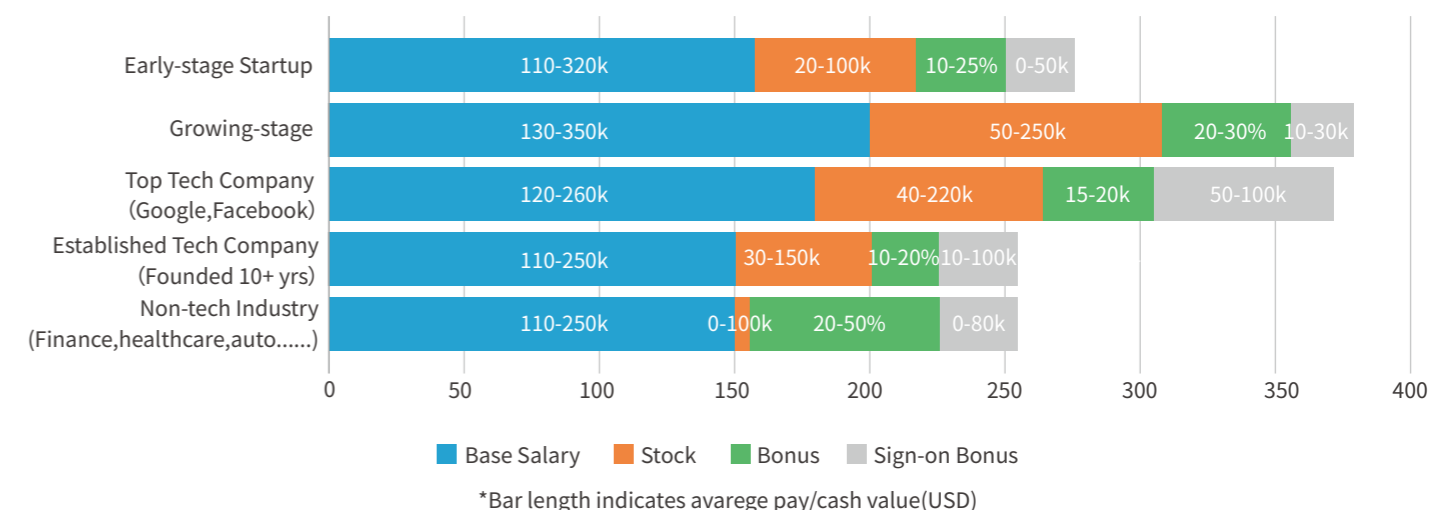


Figure 5-2 Competitive AI compensation package in Silicon Valley

Source: Global artificial intelligence industry whitepaper



Students at Silicon Valley universities have a leg up when it comes to securing employment in the job market so that Silicon Valley universities play an important role in attracting human capital. Stanford University, California Institute of Technology and University of California, Berkeley offers U.S top 20 programs to study artificial intelligence. The Silicon Valley Artificial Intelligence Research Institute (SVAIRI) is a community for global elite researchers, philosophers, entrepreneurs, and investors to discuss artificial intelligence evolving technology trends, social impact and business performance. Thus, it is sufficient to believe that diplomas from these universities are quite worthwhile. Even though International F-1 visa numbers at U.S universities have been reduced 72%<sup>①</sup> by the uncertainty caused by COVID-19, Silicon Valley academic institutions act as a magnet for talents across the globe with only losing 10.82%<sup>②</sup> F-1 student visa holders.

Silicon Valley is a well-known agglomeration of largest data centers to attract footloose tech companies and therefore attracting human capital to the local area for precious job opportunities. Silicon Valley continues to be a desirable site for tech companies due to strong computing power and massive quantities of data. Silicon Valley remains the hub for AI startups, with 37 of 50 honorees coming from the San Francisco Bay Area<sup>③</sup>. That said, Silicon Valley has the highest AI company density and top AI talents will view Silicon valley as a desired place to work in. As a cloud computing provider, Silicon Valley has high-quality IT infrastructure and makes Silicon Valley a destination of choice for tech. The region is home to America's leading tech players, including Apple, Google, Microsoft, Facebook, Intel, Cisco, Oracle and many others. Higher rent, no tax abatement, higher power price and high earthquake risk fail to affect the dominant advantage of Silicon Valley, companies see data center space in Silicon Valley as a strategic imperative that outweighs other factors. Plus, proximity to corporations and Internet consumers are also major factors in site selection.

Favorable government policies will increase the competitive advantage of Silicon Valley. The headquarters of Association for the Advancement of Artificial Intelligence (AAAI) is Palo Alto, which can advance the impact of Silicon Valley on a global scale. The White House Launches the National Artificial Intelligence Initiative<sup>④</sup>. The President's Budget prioritizes artificial intelligence, and commits to double R&D spending in nondefense artificial intelligence. With favorable government policies, holding AAAI symposium can attract over 2000 leading AI-related organizations. Senior professionals from tech giants and well-known scholars will discuss frontier issues of artificial intelligence and strategic roadmap, which will affect the soft power of Silicon Valley in the AI domain and further attract global AI elites.

① Data Source: <https://www.ice.gov/news/releases/ice-report-international-students-us-details-impact-covid>

② According to the data released by ICE, we compute this number manually.

③ Source: <https://www.forbes.com/sites/alanohnsman/2021/04/26>

④ Source: <https://trumpwhitehouse.archives.gov/briefings-statements/president-trumps-fy-2021-budget-commits-double-investments-industries-future/>

## Series 2 New Thinking About the International Talent Flow

### ■ Snapshot of international talent flow shaped by the pandemic

Talent is one of the critical resources for the sustainable development of the economy and society while it is also the foundation of innovation. Innovation is essentially driven by talents. Whoever has world-class innovative talents will be endowed with the advantages and leading power of technological innovation.

**On the one hand, international talents are closely related to promoting the core competitiveness of urban areas.** With the in-depth development of the new round of scientific and technological revolution and industrial transformation, strengthening the cultivation of innovative technological talents is related to the high-quality development of urban industries and overall core competitiveness. In this sense, high-level international scientific and technological talents with global vision are a vital force to help cities breakthrough technical barriers in key areas, improve fundamental innovation, model innovation, and application innovation, and build the city's core competitiveness. **On the other hand, international talents are significant to enhance the economic vitality of cities.** The demand for innovative talents in the capital, technology, and knowledge-intensive industries such as big data, artificial intelligence, and high-end equipment manufacturing is increasing. Therefore, attracting international talents with cutting-edge scientific knowledge and solid technical experience is conducive to fostering new drivers of urban economic growth.

With the in-depth refinement of the division of labor in the global value chain, talents, as advanced factors of production, are also required to have the ability to flow freely. However, affected by the global spread of the COVID-19 Pandemic, the global flow of international talents has been hindered to varying degrees. Specifically, to prevent the virus's global spread, countries have temporarily closed their borders. As international flights are reduced or grounded, visas and work permits are suspended, international business travel is decreased, and "pause button" has been pressed on the global talent flow. According to the data released by Beijing Capital International Airport, affected by the global spread of the virus, compared with the previous year, the number of international passengers coming to China at Beijing Capital International Airport has fallen off a cliff in 2020. The total number of passengers is 2.534 million, which is only one-tenth of that in 2019. As shown in Figure 5-3, the monthly number of international passengers has decreased by 99% year on year, which means that the international flow of population has been affected to some extent.

At the same time, since countries have adopted strict control measures regarding transportation and population mobility, the global supply chain has been interrupted for a short time, which has further impacted the manufacturing of enterprises. The sudden outbreak of the COVID-19 Pandemic has severely affected industries that rely heavily on the international division of labor, such as automobiles, electronics, and machinery. The forced interruption of production and supply chain makes the performance of enterprises decline, which further leads to layoffs and reduces the demand for recruitment. Thus, the talent market generally shrinks. Taking the United States as an example, the unemployment rate reached the latest peak of 14.8% in April 2020, which was much higher than the unemployment rate caused by the financial crisis in 2008. With weak economic recovery and a high unemployment rate worldwide, the demand for international talent recruitment is correspondingly reduced, which makes it increasingly tricky for talents to flow across borders.

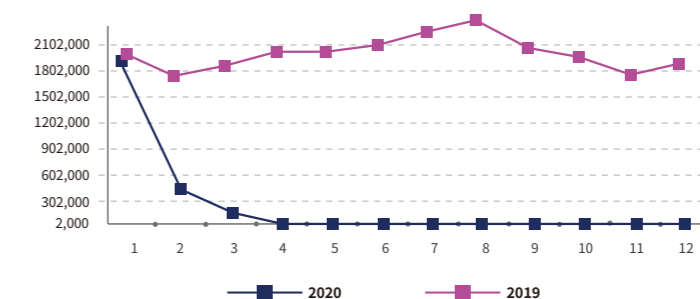


Figure 5-3 Comparison of international passenger volume changes at Beijing Capital International Airport.

■ Overseas talents attract new opportunities during the pandemics

**Firstly, during the pandemics, the return of Chinese overseas talents has increased.**

Chinese overseas students, technological innovation talents, academic talents, and other groups are constrained by the changes in the host country’s political economy and social environment. This makes the number of people considering returning to their home country for job hunting and development increase. According to the United Front Work Department of CPC Central Committee, the number of returned overseas students actively seeking jobs increased by 58.19% in 2020, compared with the same period in 2019. Recently, a survey by Peking University Future Education Management and Research Center shows that nearly 70% of Chinese overseas talents will prioritize returning to China for employment in the future. Specifically, numerous Chinese students or overseas Chinese who originally planned to apply for jobs abroad chose to return to China for employment. Affected by the pandemics, on the one hand, the overall recovery of the world economy is slow while massive companies have laid off employees or stopped recruiting new employees, which makes the unemployment rate remain high and the employment market demand insufficient. For example, in the first half of 2020, Uber--a shared travel platform--laid off 6,700 employees, accounting for 25% of the total number of employees. The U.S. government also issued an executive order in March 2020 to temporarily suspend the issuance of H-1B, H-2B, J, and L nonimmigrant visas, making it more difficult to stay in the United States for a job. On the other hand, the overseas career environment of Chinese high-level research talents has further deteriorated. Due to the decline in the number of students and donations in the western higher education industry and the deterioration of the financial situation, some universities have increased layoffs, reduced recruitment, or closed permanently. The demand for international academic talents has shrunk sharply, making high-level research talents return to China for employment.

**Secondly, during the pandemics, the return of overseas scientific and technological talents has increased.**

With the global spread of the virus, big data has played a vital role in predicting and preventing the spread of the virus while helping enterprises resume work and production. In the post-pandemic era, the rise of non-contact offices and the wide application of artificial intelligence scenes will create new demands for talents. Specifically, the hybrid remote work mode will continue. In the working scenario with computer in developed economies, about 20-25% of the labor force will work remotely for more than three days a week for a long time. Via remote online office software, it will be more flexible for overseas talents to work, thus reducing the restrictions on working hours and venues. At the same time, digital technologies represented by the Internet, cloud computing, big data, the Internet of Things, and artificial intelligence empower economic growth. Enterprises have promoted the application of automation and artificial intelligence to reduce the negative impact of the COVID-19 Pandemic. Digital platforms have triggered non-contact application scenarios such as telecommuting while connecting supply and industrial chains, further reducing business costs. With the deepening of digital transformation, compound digital talents with top digital skills, digital technology, and industry experience will become the “new darling” of the future talent market. However, due to the late start of China’s digital industry, the number of local, high-quality digital talents is relatively insufficient, which means there is a strong demand for top digital talents. In this context, high-quality overseas scientific and technological talents, especially those with outstanding abilities of Internet cloud computing, big data, and artificial intelligence, will have broad employment prospects in China.

**Series 3 Understanding Beijing Unicorns**

■ Overview of the Unicorns in Beijing

According to the list of unicorn companies in Beijing from CB Insights, Hurun, Great wall Strategy Consultants, etc., Beijing leads the world in the number of unicorn companies with 82 unicorns mainly concentrating in high-tech and emerging industries.

Developing the industries of new generation of information technology, medical and health, new energy and intelligent connected vehicle, green and smart energy as well as industries of the future, and enhancing the digital service industry are the focuses of the industrial layout of Beijing. According to the business scope of the companies, the unicorns in Beijing could be grouped into 8 industrial fields and 26 industrial segments as illustrated in Figure 5-2.

Table 5-2 Industrial classification of unicorn companies in Beijing

Industries and Sectors	Industries	Industries and Sectors	Industries	
New Generation of Information Technology	Artificial Intelligence	Medical and Health	Innovative Medicines and Equipment	
	Big Data		New Energy and Intelligent Connected Vehicle	New Energy and Intelligent Vehicle
	Integrated Circuit	Digital Services		Digital Entertainment
	Cloud Serving			Education Technology
	Internet of Things Platform		Digital Therapy	
Industries of Future	Quantum Science and Technology		Electronic Commerce	
	Commercial Aerospace	Living Services		
	Robot	Traveling and Sports		
	Industrial Digitalization	Intelligent Hardware	Intelligent Transportation	
Intelligent Logistics System		Digital Real Estate		
New Retailing		Car Service		
Enterprise Digital Services		Other Industries	Internet-famous Product	
Industrial Internet				
Financial Technology	Financial Technology			

■ Number and market valuation of unicorns in Beijing

Figure 5-4 Number of unicorns in Beijing by industries in 2020

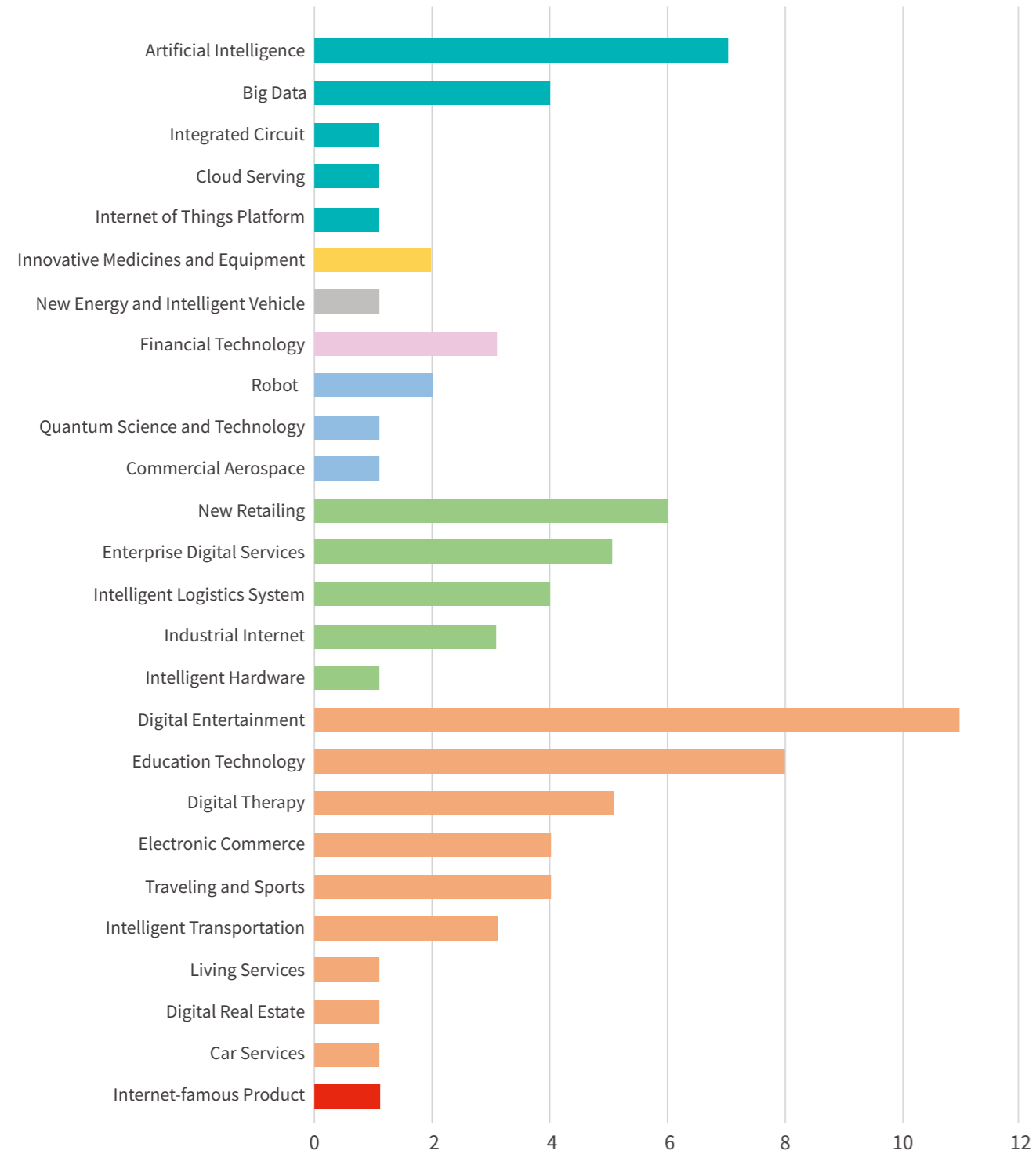
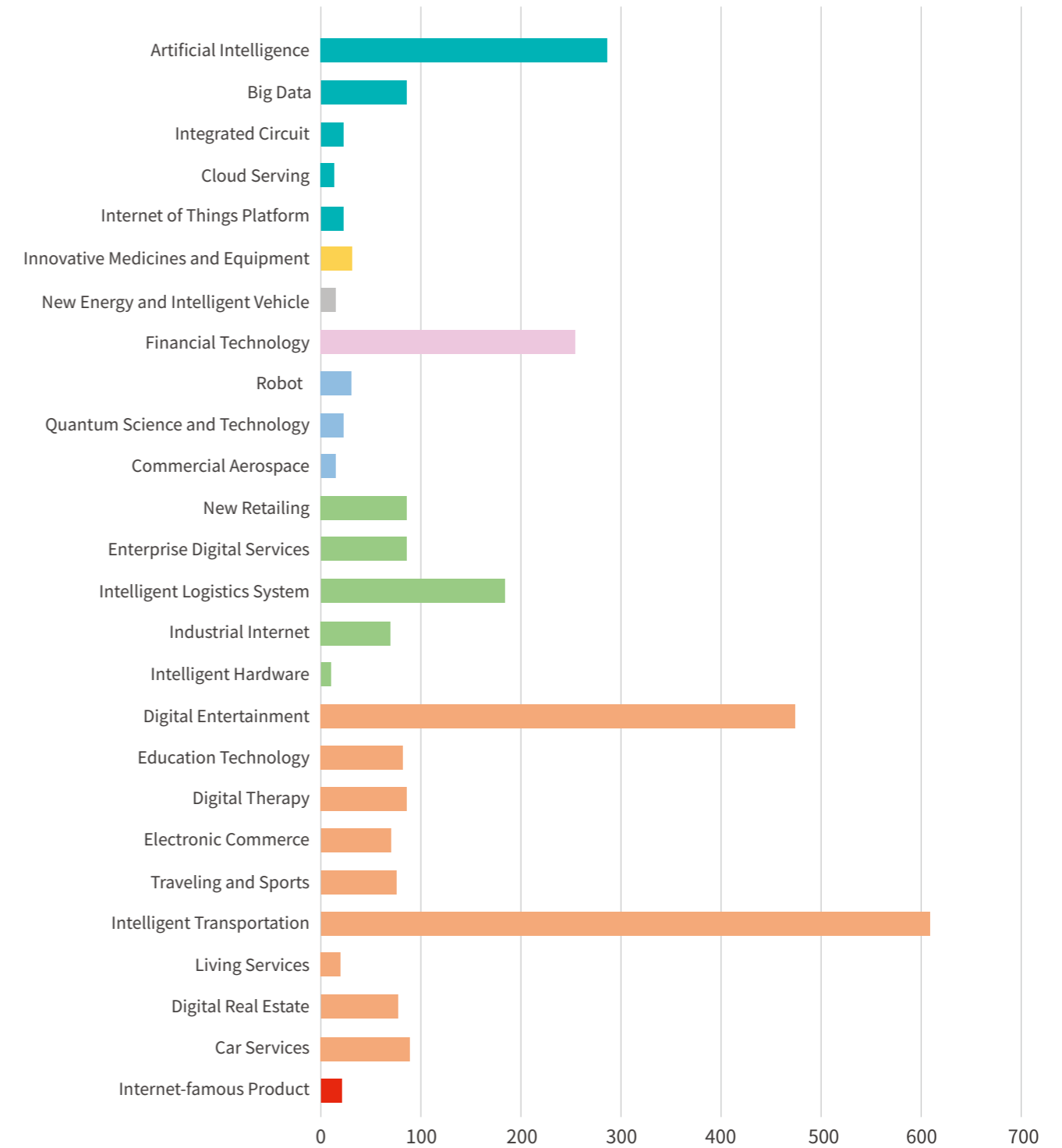


Figure 5-5 Valuation of unicorns in Beijing by industries in 2020 (billions of Dollars)





The number distribution of unicorns in Beijing shows that the field of digital services tops the list of industrial fields with a total of 38 unicorns and a proportion of 46 percent. Under the impact of COVID-19, contactless scenarios such as digital therapy match the market demand better. There are 19 unicorns in the field of industrial digitalization, mainly concentrating in the industries of new retailing, enterprise digital services, intelligent logistics systems and industrial internet, and only 1 unicorn is from the industry of intelligent hardware. 14 unicorns emerged from the field of new generation of information technology, of which 7 and 4 were generated in the industry of artificial intelligence and big data respectively. The industries of integrated circuit, cloud serving and internet of things platform developed relatively slowly with only 1 unicorn for each of them. All the industries belonging to industries of future comprise only 1 unicorn except for the robot industry which has 2 unicorns. The overall lack of unicorns indicates the industrialization of the industries of future remains in its infancy. 3 unicorns were generated in the field of financial technology. The fields of medical and health and intelligent connected vehicle have 2 and 1 unicorns respectively. In addition, 1 unicorn emerged from the industry of internet-famous product.

With regard to market value, most valuable unicorns in Beijing is highly concentrated in the field of digital services, the value of which reaches 332.6 billion dollars and accounts for 74 percent of the total value. The concentration trend of market value is even more pronounced than that of the number, indicating that the new forms and models of business and new forms of consumption rising from digital economy have significantly larger market scale and more space for development than other industries. In terms of more specific kinds, the valuation of unicorns in digital entertainment industry exceeds 200 billion dollars, accounting for around half the total value of all unicorns in Beijing. Bytedance, the largest unicorn company valued at 180 billion dollars, contributes most to the industry. Due to its extremely large scale and relative maturity compared with other unicorns, Bytedance was removed from Figure 5-5, so that it can better to illustrate the development of those emerging enterprises. The industry of intelligent transportation also has a high valuation of 61.2 billion, to

which the online transportation network giant DiDi contributes 58 billion dollars. In general, all the industries in the field of digital services have formed a considerable scale, with valuations exceeding 2 billion dollars.

The field of industrial digitalization has also formed a certain scale and the value reaches 41.4 billion dollars, accounting for about 9 percent of the total value. The industries of intelligent logistics system, enterprise digital services and industrial internet were valued at 16.9, 88, 86 and 63 billion dollars respectively, representing most of the field. Besides, a small valuation of 1 billion dollars suggests that the intelligent hardware industry is still weak.

The field of new generation of information technology has a valuation of 38.3 billion dollars and a ratio of around 8.5 percent of the total valuation. The industry of artificial intelligence contributes 27.2 billion dollars, representing more than 70 percent of the field. The industry of big data also achieves a considerable valuation of 7.2 billion dollars. However, other industries including integrated circuit, internet of things platform and cloud serving have small markets with valuations less than 1.5 billion dollars.

Unicorns in the industry of financial technology are valued at about 25.9 billion dollars, accounting for 5.7 percent of the total valuation. The average valuation of each company exceeds 8 billion dollars, suggesting the financial technology industry have both large market size and high market concentration.

The market sizes of the industries of the future are relatively small with a total valuation of 6.6 billion dollars. The robot industry has the highest valuation of 3.5 billion dollars in this field, indicating that it has achieved preliminary industrialization. Neither quantum science and technology nor commercial aerospace has a valuation over 2 billion dollars. The unicorns in the field of medical and health are valued at more than 3 billion dollars and still need further development. The industry of new energy and intelligent connected vehicles is valued at only 1.2 billion dollars and is still a field in its infancy.

■ Classic Unicorns

Based on the classification of the unicorns, the classic unicorn of each industry was selected and analyzed to provide insights at the level of the enterprise. Figure 5-3 shows that top unicorns in their fields have advantages in gathering top talents in their industries.. Besides, the valuable educational background and industry experience of the talents enable the unicorn companies a first-mover advantage on product research.

Overall, the unicorns of various industrial fields show strong similarity in talent structure and demand: the core business team is often composed by top experts and scholars, outstanding young scholars, serial entrepreneurs, and personnel returning from overseas. In terms of the demand for talents, most unicorns have high demand for high-quality professionals related to their industries, high-tech developers, and senior managerial talents.

Table 5-3 Educational background of founders and core team members

Industries and Sectors	Classic Unicorn	Business Scope	Backgrounds of Founders	Backgrounds of Core Team Members	Recruitment Needs
New Generation of Information Technology	Sense Time	Smart business, smart city, smart life, smart vehicle	Tang Xiaouu, Ph.D., Massachusetts Institute of Technology, Professor, Chinese University of Hong Kong, expert in face recognition technology	Massachusetts Institute of Technology, Chinese University of Hong Kong, Tsinghua University, Peking University, Microsoft, Google, Lenovo, Baidu	Algorithm research, technical development, product project management, commercial sales
Medical and Health	Novogene	Application of cutting edge NGS and high-performance computing on life science research and human health	Li Ruiqiang, Ph.D. in Biology, University of Copenhagen, Denmark, Honorary Associate Professor, Department of Computer Science, University of Hong Kong	Peking University, Hiroshima University, China agricultural university	Bioinformatics, technical development, experiment and production
New Energy and Intelligent Connected Vehicle	TuSimple	Autonomous truck driving solutions	Chen Mo, Chinese Canadian, a serial entrepreneur Hou Xiaodi, Ph.D., California Institute of Technology, expert in computer vision and cognitive science	Domestic and foreign professionals in investment, truck transportation, and automated vehicles	Algorithm and software development in the field of transportation
Industrial Digitalization	PingCAP	Products, solutions and consulting of database	Liu Qi, well-know expert on Go programming language and Redis, former senior system architect in JD and Wandoujia	Talents in Data management	Technology experts in data management

Continued:

Industries and Sectors	Classical Unicorn	Business Scope	Backgrounds of Founders	Backgrounds of Core Team Members	Recruitment Needs
Financial Technology	AIBANK	Financial technology and open banking innovation	China CITIC Bank, Baidu	Senior bankers and Internet elites	Professionals in big data development, finance and law
Industries of Future	Geek+	Robotics and artificial intelligence technology for warehouse and factory operations.	Zheng Yong, dual master in industrial engineering from Tsinghua University and production engineering from Aachen University, Germany Li Hongbo, Ph.D. in computer Science, Tsinghua University, expert in robotics	Doctors and masters from Tsinghua University, Chinese Academy of Sciences, Beijing University of Aeronautics and Astronautics, University of Science and Technology Beijing, etc.	Product design, software and hardware engineering
Digital Services	Medbanks	Commercial insurance and personalized health care services	Ma Xuguang, B.S. in clinical medicine, Harbin Medical University, BiMBA, Peking University, used to work in Schilling, Germany, Bayer, Germany	Talents with working experience in multinational pharmaceutical companies such as Bayer, Roche, Pfizer, Sanofi and large technology companies such as Microsoft and Baidu	Medical and health, insurance, big Data
Retailing and Consumption	Dmall	omni-channel digital retail service provider providing cloud-based, one-stop digitalization solution to brick-and-mortar retailers	Zhang Wenzhong, a famous entrepreneur, the founder of Wumart Group, a postdoctoral researcher at Stanford University	The members in management have rich technical and management experience in the world's top 500 and large Internet companies	Internet research and development, product management and project operation



## ■ Talent attractiveness of unicorn companies in Beijing

With factors of innovation gathering in the city, it has formed strong attraction to innovative and entrepreneurial personnel, leading to the booming unicorns in Beijing. The agglomeration of unicorns, in turn, play an important role in improving the talent retention of the city.

As an intelligent city, Beijing has invested more than 6 percent of its GDP in research and development, ranking first among the world's cities on R&D investment intensity, and is well prepared for being at the forefront of the global science and technology. The high R&D investment will prompt the emergency of unicorn companies and the "little giant enterprises" that are specialized, intensive, distinctive, and innovative.

As a talent-centric city, many world-class universities are settled in Beijing including Tsinghua University (QS ranked 17) and Peking University (QS ranked 23), continuously providing talents for the unicorns to meet their intellectual needs.

As a city accumulating strength for a take-off, Beijing has founded 12 supercomputer centers, 19 large research infrastructures and several national innovation centers for technology, manufacturing, and industries. The construction of high-end platforms will help make unicorn companies grow more steadily and go further on the forefront of science and technology.

The unicorns are important sources of new ideas. In less than a decade, these unicorns have stood out from the tens of thousands of small and medium-sized enterprises in Beijing, obtaining huge financial support from venture capital institutions and achieving a valuation of more than 1 billion dollars. It is proved that the unicorns have forward-looking advantages on some market segments. The innovation in business model, breakthroughs in cutting-edge technology, and application of technology in new scenarios has become the proving ground for discovering and training talents.

The unicorns are the fertile ground for attracting innovative talents. Since innovating requires enterprises to be able to take the risk of trial-and-error cost, unicorns will have more opportunities to lead the industrialization of new knowledge and technologies than small companies, and thus have more flexibility to support talents in innovating, which matches the strong adaptability of youth to new business models. Therefore, the unicorns tend to have great attractiveness to the youth talents who are active and creative.

The support of government policies also facilitated the gathering of unicorns. With the aim of supporting enterprises, the policies are refined at the level of entrepreneurial parks to be more executable, resulting in a full-chain, all-around and multi-dimensional policy system covering financial support, tax incentives, entrepreneur services, project implementation and talent acquisition. In terms of project financing, the entrepreneurial parks serve as a unit to help companies in equity financing, risk subsidies and reducing financing costs to broaden their financing channels. In terms of the implementation of the entrepreneurial programs, the government provides companies with financial and platform support to help them in technology development, achievement transformation, product demonstrations and applications, as well as the integration into the industrial ecosystem. In terms of entrepreneurial services, the government continues to improve the "one-stop" public service system and optimize the information platform. In terms of talent acquisition, the government has introduced a series of policies to support excellent teams on talent introduction. The chief founders and the core members of entrepreneurial teams with large amounts of independent investment or equity-based cash financing can make household registration in Beijing through talent introduction. Aiming at overseas entrepreneurs, the "Hai Chuang Park" promotes the establishment of a centralized channel for the household registration of overseas students, helping companies handle the settlement of overseas students in Beijing. In 2021, a separate plan has been made for the introduction of new graduates who will work in unicorns, further enhancing the talent absorption capacity of unicorns in Beijing.





## 06 | Focuses

Under the COVID-19 Pandemic, there are new changes in the form of international talent flow and employment demand. How to show opportunities in the new situation and how to maintain and enhance the retention of city talents have put forward new requirements for city's future talent introduction work.



### ■ The report generates the following insights

City talent retention refers to the ability of a city to attract talents, which reflects the closeness of talent to the city. Talent retention focuses on caring for talents, improving the development environment, and enhancing the perception of talent experience, which is highly compatible with the concept of “talent-oriented” and “multi-lateral win-win.” This report aims to promote the concept change regarding talent work of global city administrators and guide them to transform the roles into serving talents.

The dynamic changes of talent demand, the stage characteristics of the city shortboard, and the systematic nature of talent ecological engineering determine that it is difficult to solve all the problems of city talent ecological shortboard in the short term. Investing limited resources scientifically and reasonably to supplement the shortboard is more conducive to improving the cohesion level of city talent retention.

Under the shadow of the COVID-19 Pandemic, cities around the world face opportunities when in danger. Cities with successful virus prevention and control have become the “safe harbor” for talents to work and live, which provides necessary conditions for seizing the opportunity to attract and retain talents. As a symbol of cultural openness and cohesiveness, “exogenous talent growth” is a “mirror” of cities retention.

Digital talents have become an important asset to realize the global economic recovery. Digital technologies, represented by artificial intelligence, big data and the Internet of Things, are deeply integrated with traditional industries, unleashing enormous energy and playing an important role in global economic recovery. The flow of digital talents is a key element to realize the sharing of "digital achievements", the symbiosis of "digital cooperation" and the "win-win" situation in the era of digital economy. It is also the core driving force to promote the global economic recovery.

### ■ The report appeals to global city administrators

First, it is suggested to actively grasp the new trend of the economic era and meet the new wave of digital talents. The promotion of digital industrialization and industrial digitization has become the main driving force to create a new paradigm of innovation-driven industrial development. Digital transformation has become an important driver of urban economic growth. International talents with ICT professional skills, complementary skills, and general skills will become an important force for multinational companies to restructure their global business layout. In the future, the size of the net inflow of digital and highly skilled international talents will represent the strength of city talents retention. City administrators should invest more in R&D in the digital economy and establish a global data partnership alliance, promote the flow of digital talents, share data, reduce the cost of data transmission, help enterprises bring in international digital talents, and create a dynamic digital economy innovation and entrepreneurship ecology.

Second, it is suggested to support small and medium-sized enterprises and nurture more Unicorn enterprises. While almost every city breeds numerous small and sophisticated enterprises, most cities in Europe are sparse in large and strong Unicorn enterprises. Unicorn enterprises feature high valuation, young age, and rapid development, with the first-mover advantage of niche markets and cutting-edge technological breakthroughs. The clustering of Unicorn enterprises will enhance the city's ability to absorb talents such as R&D technicians, venture capitalists, and business managers. City administrators should form a cluster of special industries to help enterprises gain more attention from venture capital institutions in the park to form more technology-based Unicorn enterprises in the region. According to their positioning, some European cities can selectively introduce famous Unicorn enterprises in Beijing to build R&D centers, create rich urban innovation ecology, and promote the sharing of innovation achievements and the circulation of talent resources among cities.

Third, it is suggested to strengthen the connectivity of cities to provide basic guarantees for international talent return. Cities should strengthen the efforts to prevent and control the pandemics and create conditions for cities worldwide to resume and increase international flights. Among global cities with successful pandemics prevention and control, it is significant for cross-regional talent flow to gradually restore the operational capacity of international airports and build a channel of mutual connection on the premise of ensuring the health and safety of local residents.

Fourth, it is suggested to build the brand of city's international well-known educational institutions and bring in top scholars to build brand projects. City administrators should focus on expanding the scale of overseas students. Carrying out joint training programs with colleges and universities in other cities worldwide and “diversifying” enrollment of a certain proportion of international students are essential in enhancing city talent retention. While improving international education, cities should pay attention to building and promoting their educational brands to expand their global influence fully.

Fifth, it is suggested to pay attention to the personal experience of talent and form a strong talent magnet. Enriching talent experience is a “must” to consolidate city talent retention. From the reasonable allocation of financial funds in public resources such as health care and education to the continuous reduction of the cost of clothing, food, housing, and transportation for talents, and then to urban security will be the focus of city administrators in the future. Creating a comfortable and reassuring living environment for talents will be the central theme of future talent work in cities. From the sense of experience to the sense of identity, and finally form a sense of belonging, city administrators are required to put themselves in the shoes of talents, truly care for talents, and create a favorable social atmosphere of advocating science and respecting talents.



## 07 | Appendix

### ■ Calculation Method

In view of the main characteristics of the construction of the city talent retention index system, we mentioned in the 2020 edition of the report that talents would mainly consider differentiation factors for regional selection. If the regional variation of an indicator performs strongly, cities that perform well on this indicator are more likely to attract talent, therefore the indicator will share bigger weight. The 2021 version of the report followed this concept and optimizes the weight setting, using the CRITIC weight calculation method that can reflect the difference of data and give consideration to the relevance of data.

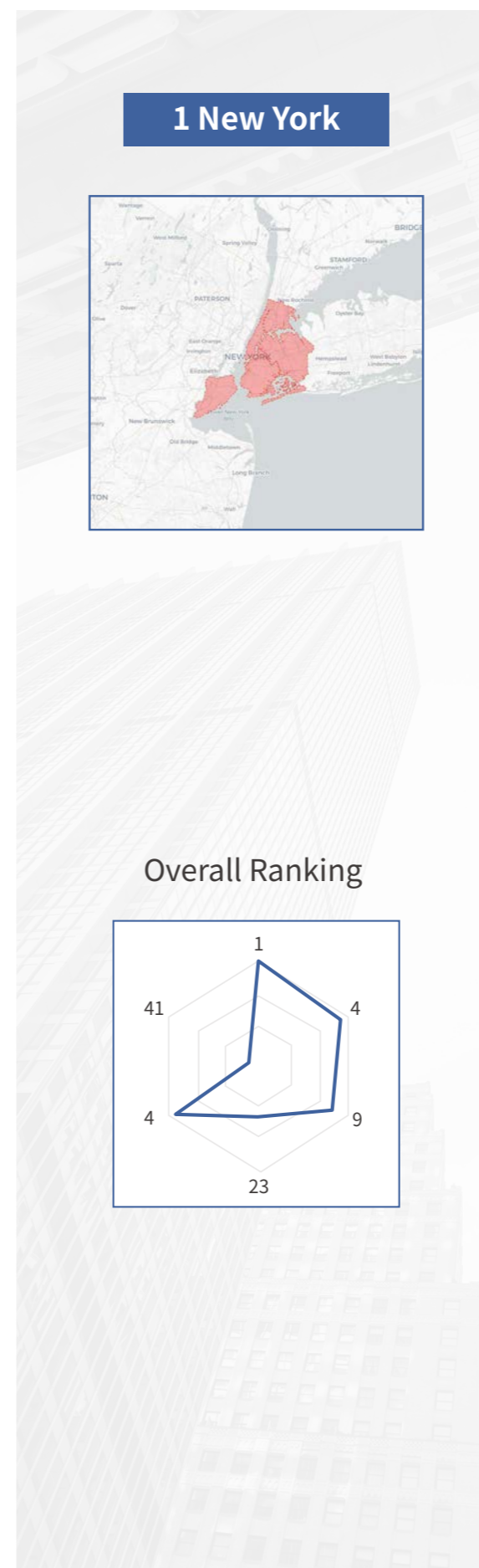
We evaluated the six dimensions respectively by using “CRITIC-TOPSIS”, obtained the scores that cities performed on each dimension. On the one hand, considering the existence of some of negative indicators, TOPSIS can measure the index system which contains positive and negative indicators. On the other hand, TOPSIS can effectively solve the problem like non-normal distribution and dimensional inconsistency of the raw data and provide objective evaluation results. In order to map the score in the range [50,100], We treated the raw score  $\varphi$  as follows:

$$\varphi' = 50 + 50 * \left( \frac{\varphi - \varphi_{min}}{\varphi_{max} - \varphi_{min}} \right)$$

According to the comprehensive score of each pillar mapped on the interval [50,100], we used coefficient of total correlation method to calculate the weight to eliminate the influence of collinearity factors. Among them, economics (0.15), innovation (0.23), culture (0.13), environment (0.16), social welfare (0.14), life burden (0.19). Finally, the total score of city talent retention index was obtained by weighting.

### ■ City Profile

The report attached talent cards from 50 cities around the world, hoping to provide valuable clues for all parties concerned.



### Economic Pillar 100.00

Overall Ranking 1

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	1	2

### Innovation Pillar 86.19

Overall Ranking 4

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	10	4

### Culture Pillar 87.46

Overall Ranking 9

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	4	4	25

### Environment Pillar 78.82

Overall Ranking 23

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	32	22

### Social Welfare Pillar 77.91

Overall Ranking 4

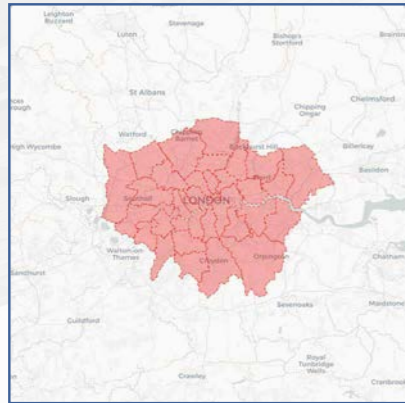
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	2	8
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	48	7

### Life Burden Pillar 68.16

Overall Ranking 41

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	18	48
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	42	42

## 2 London



### Economic Pillar 92.55

Overall Ranking 4

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	4	12

### Innovation Pillar 78.52

Overall Ranking 7

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	47	3

### Culture Pillar 100.00

Overall Ranking 1

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	5	6	3

### Environment Pillar 81.48

Overall Ranking 16

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	9	24

### Social Welfare Pillar 73.38

Overall Ranking 10

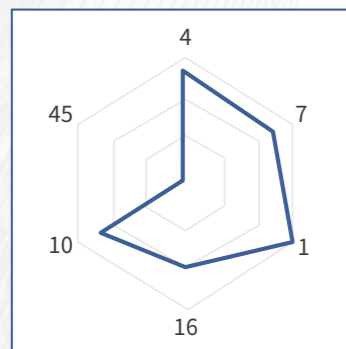
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	17	34
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	4	3

### Life Burden Pillar 63.84

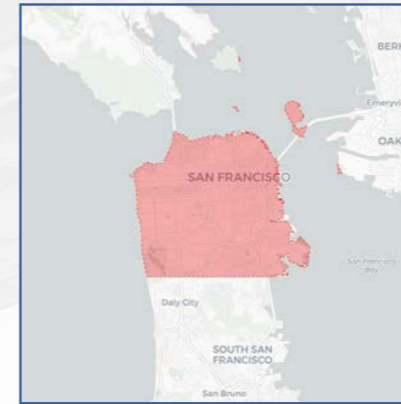
Overall Ranking 45

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	39	26
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	45	46

Overall Ranking



## 3 San Francisco



### Economic Pillar 67.98

Overall Ranking 13

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	13	1

### Innovation Pillar 91.44

Overall Ranking 2

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	5	2

### Culture Pillar 90.35

Overall Ranking 7

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	30	7	6

### Environment Pillar 89.06

Overall Ranking 7

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	2	18

### Social Welfare Pillar 75.49

Overall Ranking 6

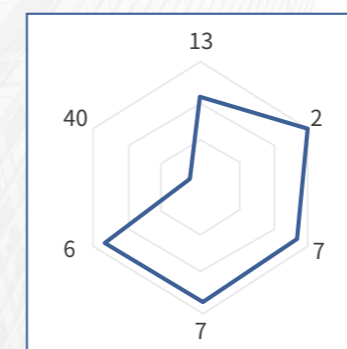
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	1	43
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	46	20

### Life Burden Pillar 69.20

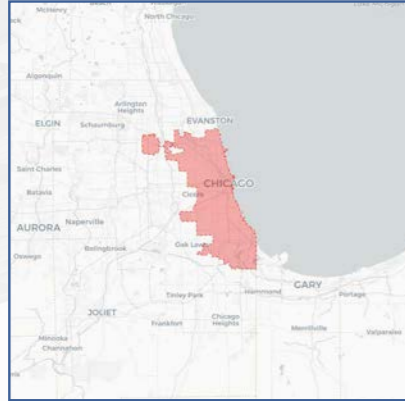
Overall Ranking 40

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	6	47
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	47	47

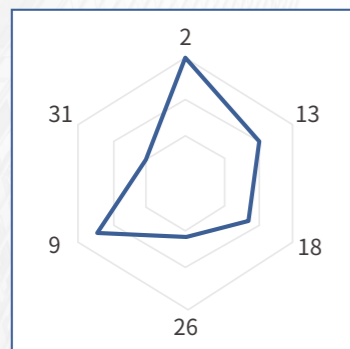
Overall Ranking



## 4 Chicago



### Overall Ranking



### Economic Pillar 95.11

Overall Ranking 2

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	2	7

### Innovation Pillar 74.86

Overall Ranking 13

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	27	8

### Culture Pillar 79.96

Overall Ranking 18

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	14	17	14

### Environment Pillar 78.25

Overall Ranking 26

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	39	17

### Social Welfare Pillar 73.44

Overall Ranking 9

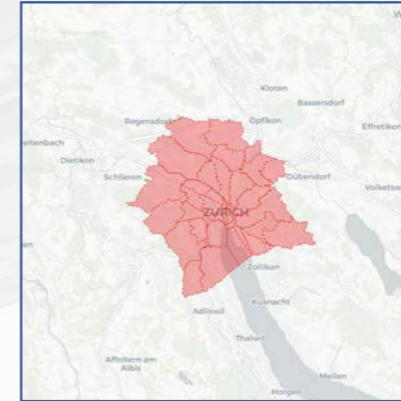
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	4	10
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	41	8

### Life Burden Pillar 75.23

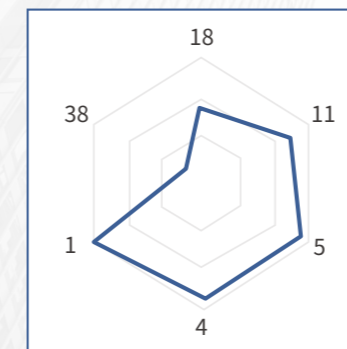
Overall Ranking 31

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	3	34
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	38	49

## 5 Zurich



### Overall Ranking



### Economic Pillar 65.45

Overall Ranking 18

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	20	6

### Innovation Pillar 75.46

Overall Ranking 11

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	13	12

### Culture Pillar 92.70

Overall Ranking 5

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	20	10	5

### Environment Pillar 95.95

Overall Ranking 4

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	27	2

### Social Welfare Pillar 100.00

Overall Ranking 1

Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	6	16
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	43	1

### Life Burden Pillar 70.95

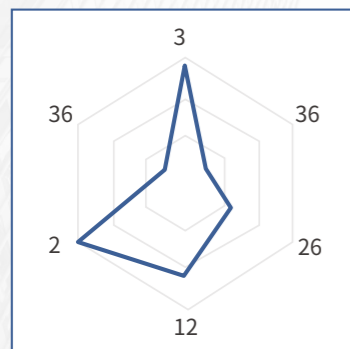
Overall Ranking 38

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	1	50
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	15	1

## 6 Washington DC



### Overall Ranking



### Economic Pillar 94.97

Overall Ranking 3

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	3	5

### Innovation Pillar 61.90

Overall Ranking 36

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	33	29

### Culture Pillar 70.48

Overall Ranking 26

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	27	23	20

### Environment Pillar 87.94

Overall Ranking 12

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	26	13

### Social Welfare Pillar 81.81

Overall Ranking 2

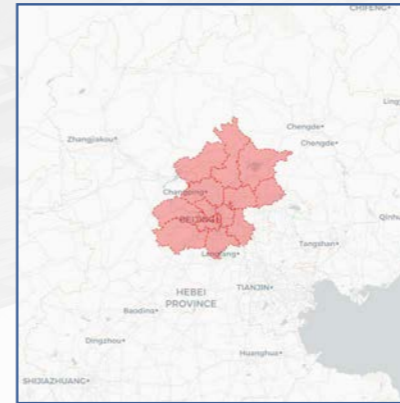
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	3	3
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	2	21

### Life Burden Pillar 72.56

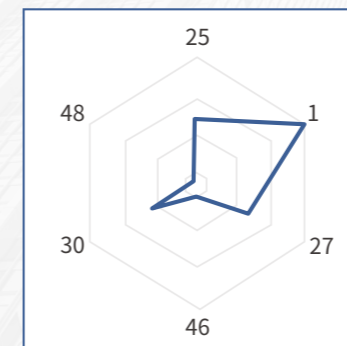
Overall Ranking 36

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	10	41
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	39	48

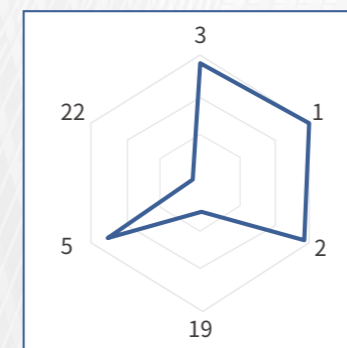
## 7 Beijing



### Overall Ranking



### Domestic Ranking



### Economic Pillar 63.32

Overall Ranking 25 / Domestic Ranking 3

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	24 (3)	28 (3)

### Innovation Pillar 100.00

Overall Ranking 1 / Domestic Ranking 1

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	1 (1)	1 (1)

### Culture Pillar 69.82

Overall Ranking 27 / Domestic Ranking 2

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	6 (1)	32 (5)	29 (4)

### Environment Pillar 58.01

Overall Ranking 46 / Domestic Ranking 19

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	44 (20)	45 (18)

### Social Welfare Pillar 58.35

Overall Ranking 30 / Domestic Ranking 5

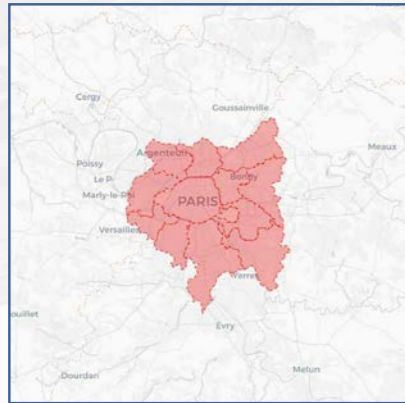
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	29 (3)	28 (12)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	9 (1)	26 (2)

### Life Burden Pillar 56.77

Overall Ranking 48 / Domestic Ranking 22

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	48 (21)	23 (22)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	44 (22)	26 (16)

## 8 Paris



### Economic Pillar 77.99

Overall Ranking 6

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	6	13

### Innovation Pillar 74.97

Overall Ranking 12

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	24	9

### Culture Pillar 83.20

Overall Ranking 12

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	1	21	11

### Environment Pillar 78.64

Overall Ranking 24

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	8	31

### Social Welfare Pillar 66.19

Overall Ranking 21

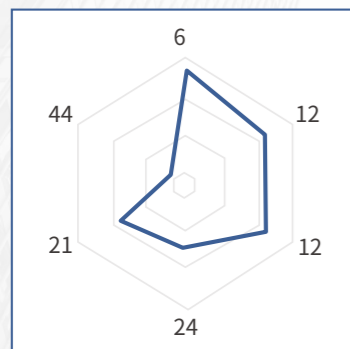
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	14	36
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	12	14

### Life Burden Pillar 65.34

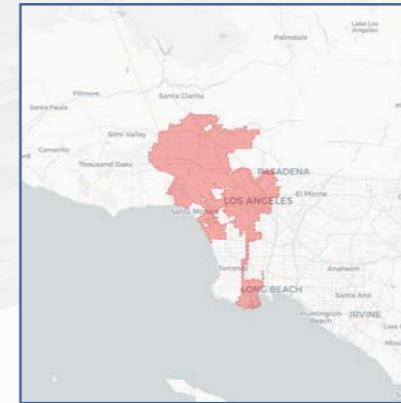
Overall Ranking 44

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	28	46
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	40	45

### Overall Ranking



## 9 Los Angeles



### Economic Pillar 68.42

Overall Ranking 11

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	12	4

### Innovation Pillar 76.15

Overall Ranking 8

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	2	21

### Culture Pillar 95.59

Overall Ranking 2

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	9	7	4

### Environment Pillar 79.77

Overall Ranking 22

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	5	33

### Social Welfare Pillar 67.64

Overall Ranking 18

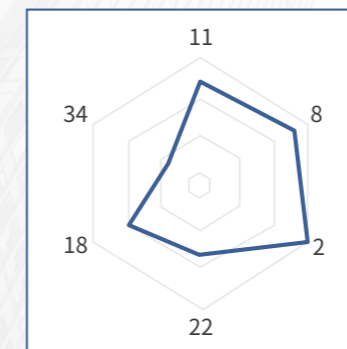
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	5	24
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	50	24

### Life Burden Pillar 73.46

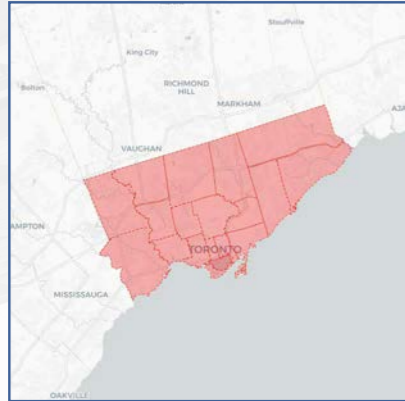
Overall Ranking 34

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	12	35
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	50	43

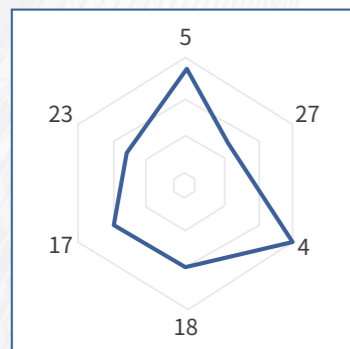
### Overall Ranking



## 10 Toronto



### Overall Ranking



### Economic Pillar 79.07

Overall Ranking 5

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	5	17

### Innovation Pillar 64.62

Overall Ranking 27

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	27	25

### Culture Pillar 92.72

Overall Ranking 4

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	13	2	11

### Environment Pillar 80.44

Overall Ranking 18

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	40	11

### Social Welfare Pillar 68.56

Overall Ranking 17

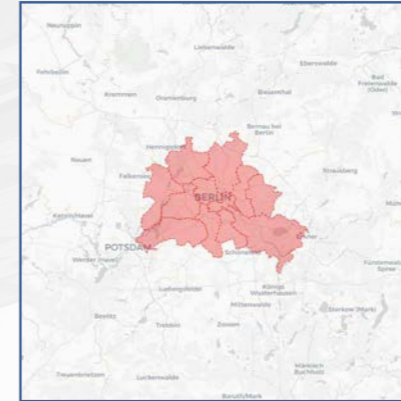
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	11	12
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	47	10

### Life Burden Pillar 80.43

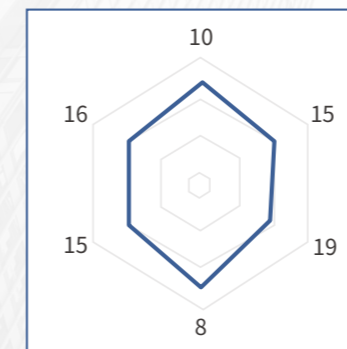
Overall Ranking 23

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	15	30
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	43	35

## 11 Berlin



### Overall Ranking



### Economic Pillar 68.51

Overall Ranking 10

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	10	23

### Innovation Pillar 73.76

Overall Ranking 15

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	16	13

### Culture Pillar 79.26

Overall Ranking 19

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	34	16	10

### Environment Pillar 89.06

Overall Ranking 8

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	21	12

### Social Welfare Pillar 68.93

Overall Ranking 15

Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	18	6
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	10	17

### Life Burden Pillar 86.29

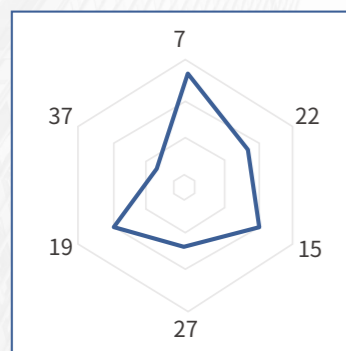
Overall Ranking 16

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	5	28
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	13	36

## 12 Singapore



### Overall Ranking



### Economic Pillar 76.28

Overall Ranking 7

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	7	22

### Innovation Pillar 69.11

Overall Ranking 22

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	42	13

### Culture Pillar 81.88

Overall Ranking 15

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	22	5	30

### Environment Pillar 77.87

Overall Ranking 27

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	45	9

### Social Welfare Pillar 67.32

Overall Ranking 19

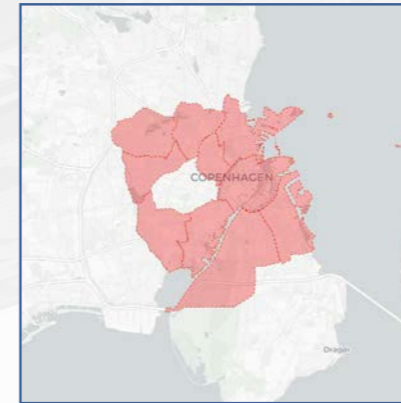
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	9	19
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	43	11

### Life Burden Pillar 71.19

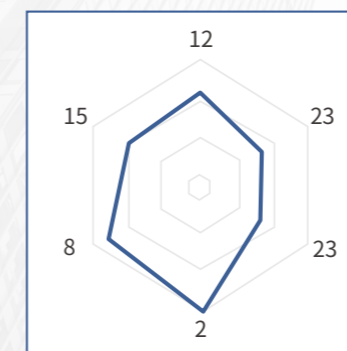
Overall Ranking 37

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	34	40
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	35	12

## 13 Copenhagen



### Overall Ranking



### Economic Pillar 68.32

Overall Ranking 12

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	11	10

### Innovation Pillar 68.23

Overall Ranking 23

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	6	32

### Culture Pillar 75.52

Overall Ranking 23

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	24	20	16

### Environment Pillar 96.32

Overall Ranking 2

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	18	5

### Social Welfare Pillar 74.10

Overall Ranking 8

Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	12	29
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	5	4

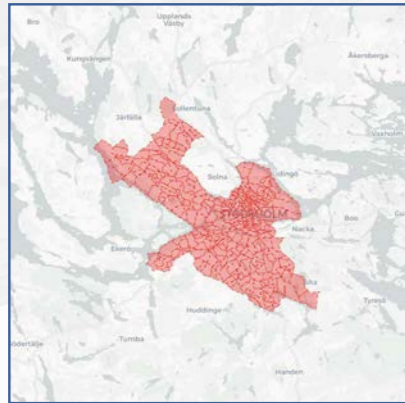
### Life Burden Pillar 87.12

Overall Ranking 15

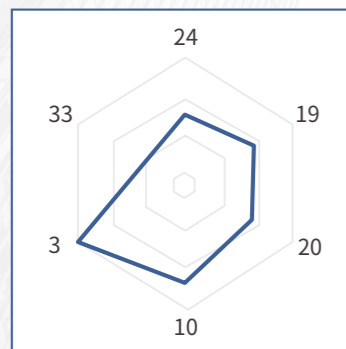
Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	14	30
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	3	6



## 14 Stockholm



### Overall Ranking



### Economic Pillar 63.62

Overall Ranking 24

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	25	11

### Innovation Pillar 69.70

Overall Ranking 19

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	9	22

### Culture Pillar 77.34

Overall Ranking 20

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	32	14	22

### Environment Pillar 88.30

Overall Ranking 10

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	36	4

### Social Welfare Pillar 78.96

Overall Ranking 3

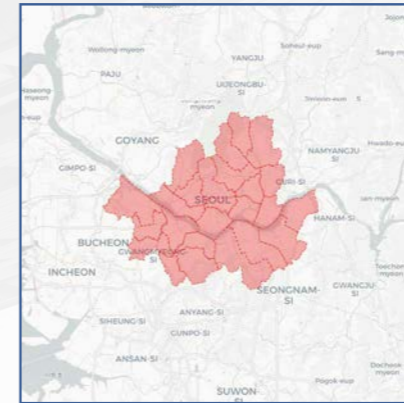
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	15	2
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	10	16

### Life Burden Pillar 73.48

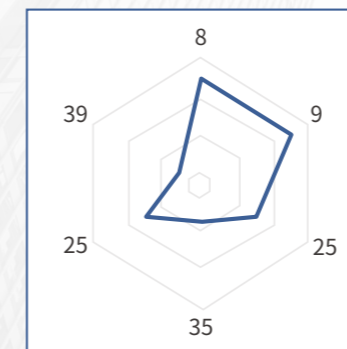
Overall Ranking 33

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	23	42
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	26	41

## 15 Seoul



### Overall Ranking



### Economic Pillar 73.86

Overall Ranking 8

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	8	25

### Innovation Pillar 76.02

Overall Ranking 9

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	7	17

### Culture Pillar 73.06

Overall Ranking 25

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	18	22	18

### Environment Pillar 73.38

Overall Ranking 35

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	37	25

### Social Welfare Pillar 61.00

Overall Ranking 25

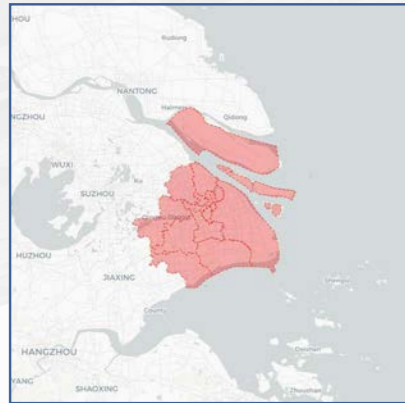
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	23	41
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	35	15

### Life Burden Pillar 70.77

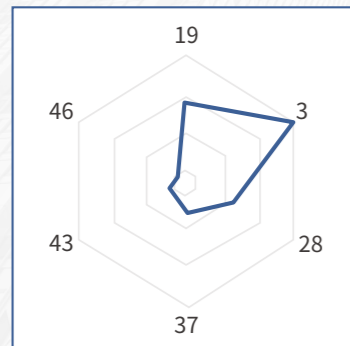
Overall Ranking 39

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	37	38
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	37	7

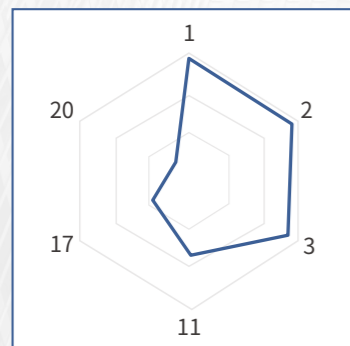
## 16 Shanghai



### Overall Ranking



### Domestic Ranking



### Economic Pillar 65.28

Overall Ranking 19 / Domestic Ranking 1

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	17 (1)	29 (4)

### Innovation Pillar 87.06

Overall Ranking 3 / Domestic Ranking 2

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	8 (4)	5 (2)

### Culture Pillar 68.24

Overall Ranking 28 / Domestic Ranking 3

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	8 (2)	29 (2)	28 (3)

### Environment Pillar 72.03

Overall Ranking 37 / Domestic Ranking 11

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	19 (5)	40 (14)

### Social Welfare Pillar 53.71

Overall Ranking 43 / Domestic Ranking 17

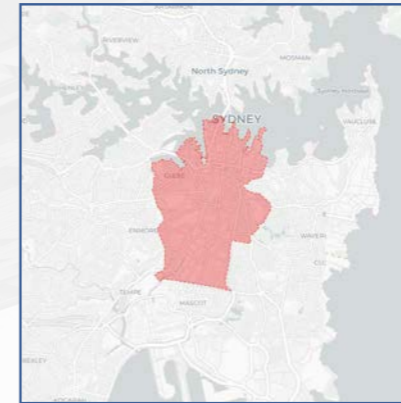
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	28 (2)	39 (18)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	31 (14)	33 (8)

### Life Burden Pillar 63.59

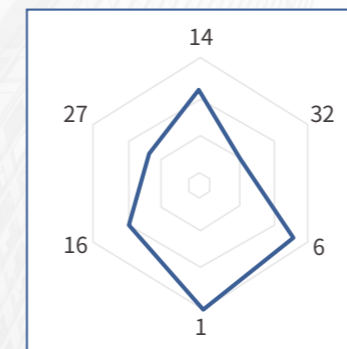
Overall Ranking 46 / Domestic Ranking 20

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	46 (19)	22 (21)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	46 (23)	31 (21)

## 17 Sydney



### Overall Ranking



### Economic Pillar 67.34

Overall Ranking 14

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	14	8

### Innovation Pillar 62.70

Overall Ranking 32

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	21	32

### Culture Pillar 92.19

Overall Ranking 6

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	38	1	8

### Environment Pillar 100.00

Overall Ranking 1

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	3	7

### Social Welfare Pillar 68.81

Overall Ranking 16

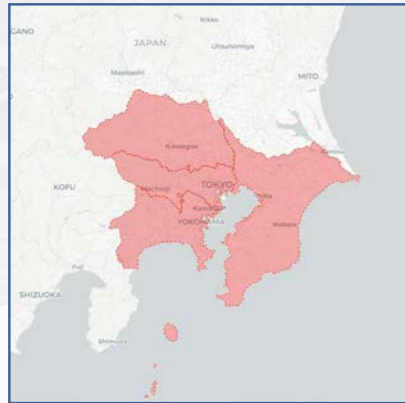
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	7	17
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	19	22

### Life Burden Pillar 77.91

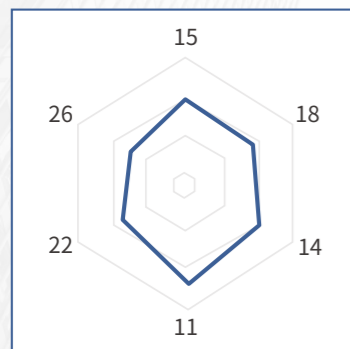
Overall Ranking 27

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	13	44
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	41	24

## 18 Tokyo



### Overall Ranking



### Economic Pillar 66.99

Overall Ranking 15

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	15	19

### Innovation Pillar 71.56

Overall Ranking 18

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	12	20

### Culture Pillar 82.03

Overall Ranking 14

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	21	27	1

### Environment Pillar 88.06

Overall Ranking 11

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	13	16

### Social Welfare Pillar 64.16

Overall Ranking 22

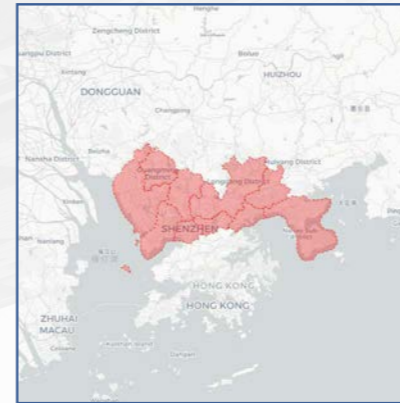
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	16	38
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	30	13

### Life Burden Pillar 79.72

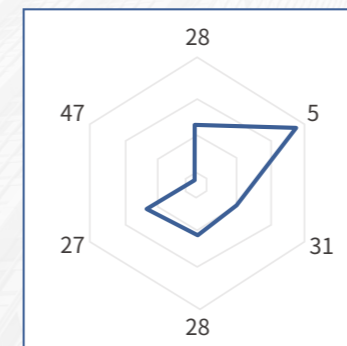
Overall Ranking 26

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	19	45
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	33	4

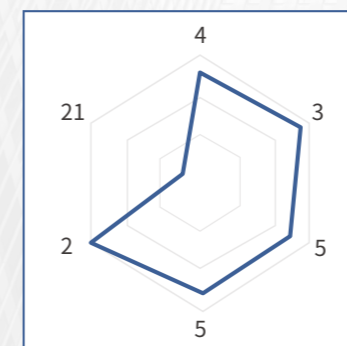
## 19 Shenzhen



### Overall Ranking



### Domestic Ranking



### Economic Pillar 62.55

Overall Ranking 28 / Domestic Ranking 4

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	26 (4)	35 (8)

### Innovation Pillar 84.56

Overall Ranking 5 / Domestic Ranking 3

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	4 (3)	7 (4)

### Culture Pillar 65.65

Overall Ranking 31 / Domestic Ranking 5

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	28 (7)	35 (8)	26 (2)

### Environment Pillar 77.75

Overall Ranking 28 / Domestic Ranking 5

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	24 (9)	27 (6)

### Social Welfare Pillar 59.19

Overall Ranking 27 / Domestic Ranking 2

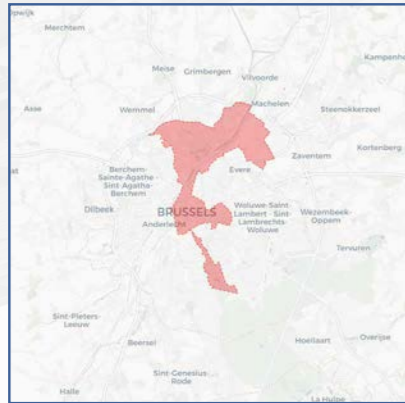
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	33 (7)	11 (1)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	38 (19)	30 (5)

### Life Burden Pillar 59.60

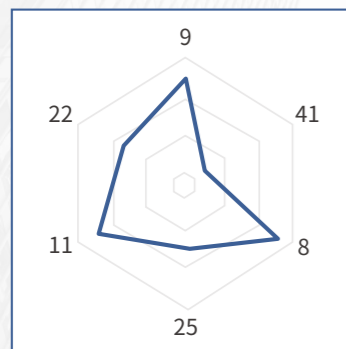
Overall Ranking 47 / Domestic Ranking 21

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	49 (22)	20 (19)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	25 (19)	9 (3)

## 20 Brussels



### Overall Ranking



### Economic Pillar 73.28

Overall Ranking 9

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	9	3

### Innovation Pillar 58.13

Overall Ranking 41

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	36	32

### Culture Pillar 90.12

Overall Ranking 8

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	17	9	9

### Environment Pillar 78.34

Overall Ranking 25

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	17	28

### Social Welfare Pillar 73.18

Overall Ranking 11

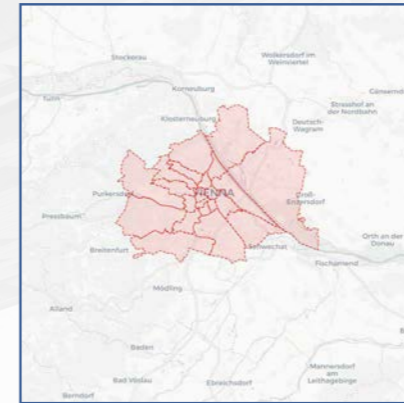
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	21	5
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	1	23

### Life Burden Pillar 81.48

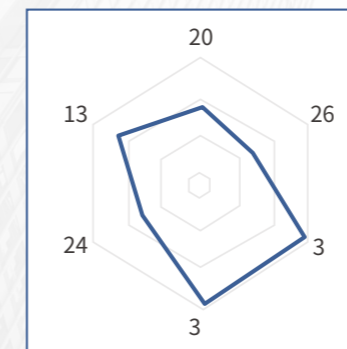
Overall Ranking 22

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	2	32
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	22	44

## 21 Vienna



### Overall Ranking



### Economic Pillar 65.00

Overall Ranking 20

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	21	16

### Innovation Pillar 66.11

Overall Ranking 26

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	11	29

### Culture Pillar 94.41

Overall Ranking 3

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	16	11	2

### Environment Pillar 96.11

Overall Ranking 3

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	25	3

### Social Welfare Pillar 62.33

Overall Ranking 24

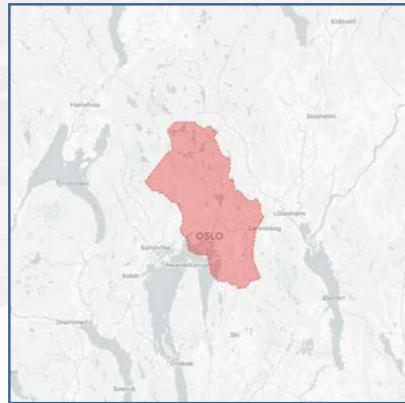
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	22	31
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	21	18

### Life Burden Pillar 89.40

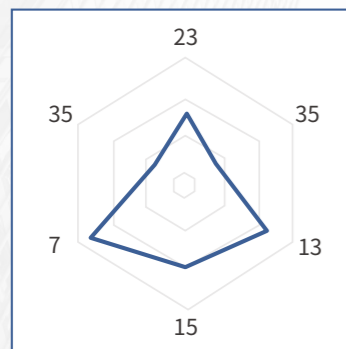
Overall Ranking 13

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	16	27
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	2	5

## 22 Oslo



### Overall Ranking



### Economic Pillar 64.36

Overall Ranking 23

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	23	14

### Innovation Pillar 61.98

Overall Ranking 35

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	19	42

### Culture Pillar 82.63

Overall Ranking 13

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	23	12	17

### Environment Pillar 81.89

Overall Ranking 15

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	43	6

### Social Welfare Pillar 75.13

Overall Ranking 7

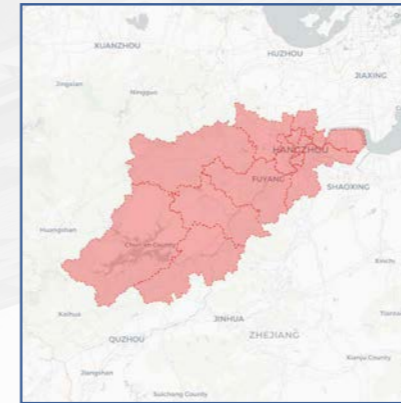
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	8	7
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	6	5

### Life Burden Pillar 73.11

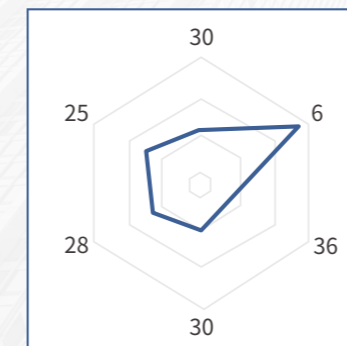
Overall Ranking 35

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	8	49
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	12	32

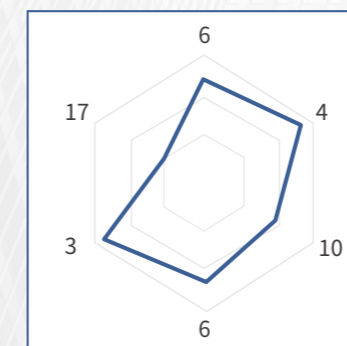
## 23 Hangzhou



### Overall Ranking



### Domestic Ranking



### Economic Pillar 60.26

Overall Ranking 30 / Domestic Ranking 6

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	30 (6)	33 (6)

### Innovation Pillar 81.19

Overall Ranking 6 / Domestic Ranking 4

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	15 (5)	6 (3)

### Culture Pillar 60.84

Overall Ranking 36 / Domestic Ranking 10

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	35 (10)	39 (12)	32 (6)

### Environment Pillar 76.07

Overall Ranking 30 / Domestic Ranking 6

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	16 (4)	37 (11)

### Social Welfare Pillar 58.79

Overall Ranking 28 / Domestic Ranking 3

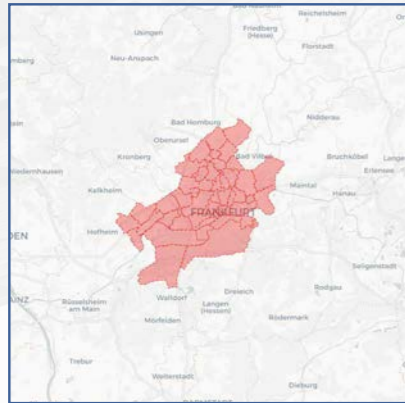
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	30 (4)	17 (5)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	13 (2)	31 (6)

### Life Burden Pillar 80.19

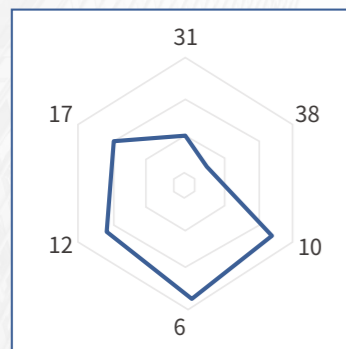
Overall Ranking 25 / Domestic Ranking 17

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	42 (16)	17 (16)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	16 (7)	8 (2)

## 24 Frankfurt



### Overall Ranking



### Economic Pillar 58.93

Overall Ranking 31

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	33	20

### Innovation Pillar 60.78

Overall Ranking 38

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	25	42

### Culture Pillar 87.38

Overall Ranking 10

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	3	13	15

### Environment Pillar 90.38

Overall Ranking 6

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	14	10

### Social Welfare Pillar 71.83

Overall Ranking 12

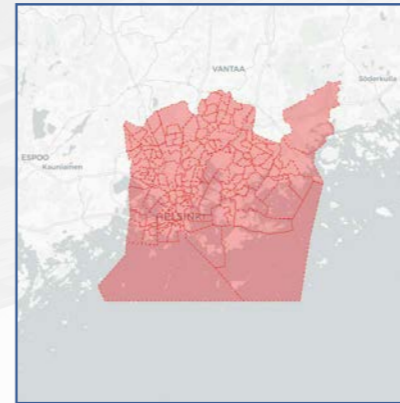
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	10	9
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	7	12

### Life Burden Pillar 86.19

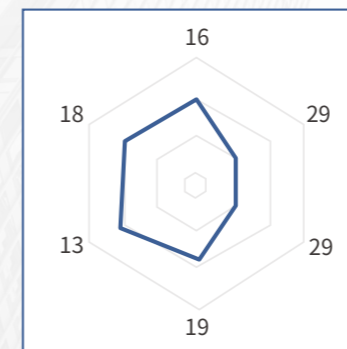
Overall Ranking 17

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	4	29
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	1	38

## 25 Helsinki



### Overall Ranking



### Economic Pillar 66.17

Overall Ranking 16

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	16	18

### Innovation Pillar 63.79

Overall Ranking 29

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	14	32

### Culture Pillar 67.56

Overall Ranking 29

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	33	26	20

### Environment Pillar 80.35

Overall Ranking 19

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	47	1

### Social Welfare Pillar 70.87

Overall Ranking 13

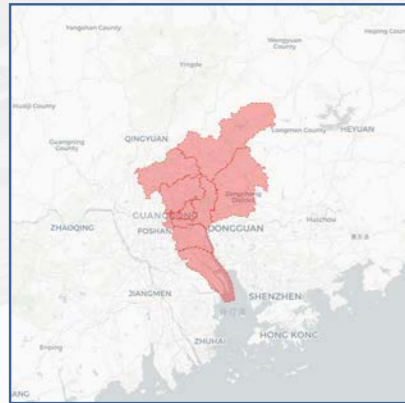
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	19	4
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	15	9

### Life Burden Pillar 84.69

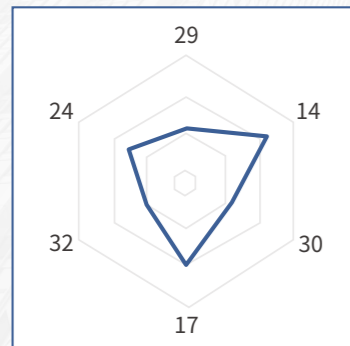
Overall Ranking 18

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	11	36
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	11	3

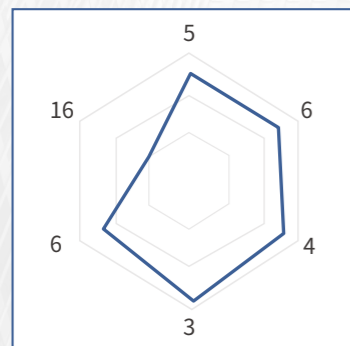
## 26 Guangzhou



### Overall Ranking



### Domestic Ranking



### Economic Pillar 61.85

Overall Ranking 29 / Domestic Ranking 5

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	29 (5)	34 (7)

### Innovation Pillar 74.14

Overall Ranking 14 / Domestic Ranking 6

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	26 (11)	10 (5)

### Culture Pillar 65.93

Overall Ranking 30 / Domestic Ranking 4

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	10 (3)	30 (3)	35 (8)

### Environment Pillar 80.60

Overall Ranking 17 / Domestic Ranking 3

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	30 (12)	20 (3)

### Social Welfare Pillar 57.89

Overall Ranking 32 / Domestic Ranking 6

Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	31 (5)	14 (3)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	29 (13)	27 (3)

### Life Burden Pillar 80.20

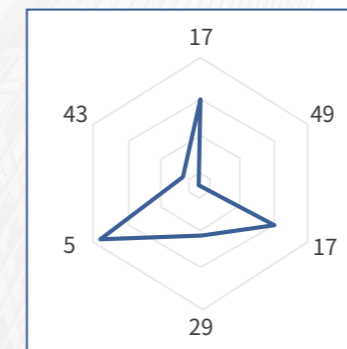
Overall Ranking 24 / Domestic Ranking 16

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	43 (17)	10 (10)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	27 (14)	10 (4)

## 27 Milan



### Overall Ranking



### Economic Pillar 65.74

Overall Ranking 17

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	18	9

### Innovation Pillar 51.54

Overall Ranking 49

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	48	42

### Culture Pillar 79.99

Overall Ranking 17

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	15	18	13

### Environment Pillar 77.46

Overall Ranking 29

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	10	35

### Social Welfare Pillar 76.97

Overall Ranking 5

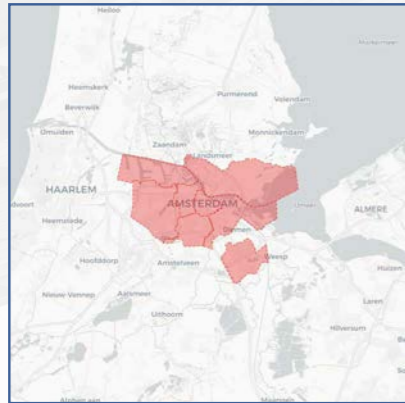
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	24	1
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	34	19

### Life Burden Pillar 65.53

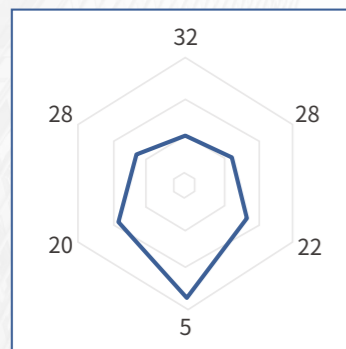
Overall Ranking 43

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	38	33
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	23	39

## 28 Amsterdam



### Overall Ranking



### Economic Pillar 58.21

Overall Ranking 32

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	37	15

### Innovation Pillar 64.29

Overall Ranking 28

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	36	22

### Culture Pillar 76.83

Overall Ranking 22

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	2	24	19

### Environment Pillar 94.89

Overall Ranking 5

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	11	8

### Social Welfare Pillar 66.51

Overall Ranking 20

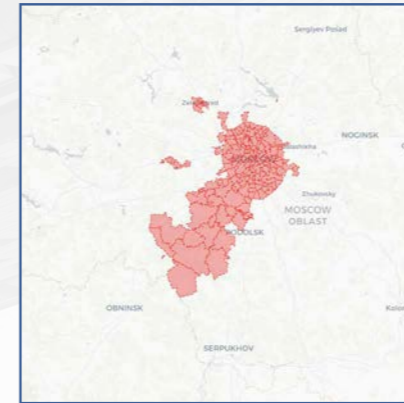
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	13	48
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	20	6

### Life Burden Pillar 77.32

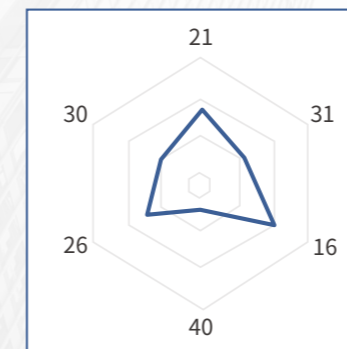
Overall Ranking 28

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	25	43
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	7	23

## 29 Moscow



### Overall Ranking



### Economic Pillar 64.89

Overall Ranking 21

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	19	31

### Innovation Pillar 63.57

Overall Ranking 31

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	41	22

### Culture Pillar 81.57

Overall Ranking 16

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	7	25	6

### Environment Pillar 67.54

Overall Ranking 40

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	46	23

### Social Welfare Pillar 60.93

Overall Ranking 26

Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	20	26
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	25	47

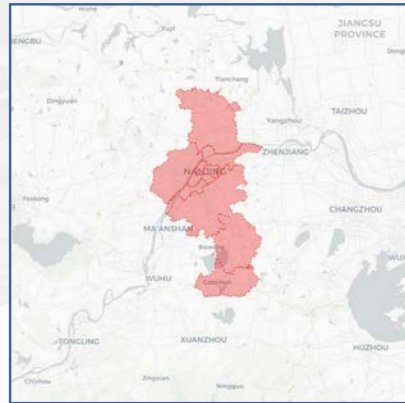
### Life Burden Pillar 75.87

Overall Ranking 30

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	40	11
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	49	37



## 30 Nanjing



### Economic Pillar 57.82

Overall Ranking 36 / Domestic Ranking 9

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	35 (10)	27 (2)

### Innovation Pillar 75.46

Overall Ranking 10 / Domestic Ranking 5

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	17 (6)	10 (5)

### Culture Pillar 57.57

Overall Ranking 41 / Domestic Ranking 14

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	42 (16)	31 (4)	36 (9)

### Environment Pillar 72.08

Overall Ranking 36 / Domestic Ranking 10

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	28 (10)	38 (12)

### Social Welfare Pillar 57.03

Overall Ranking 33 / Domestic Ranking 7

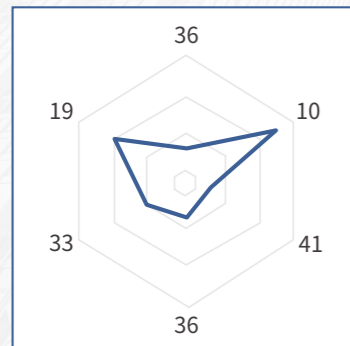
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	32 (6)	27 (11)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	16 (4)	28 (4)

### Life Burden Pillar 84.18

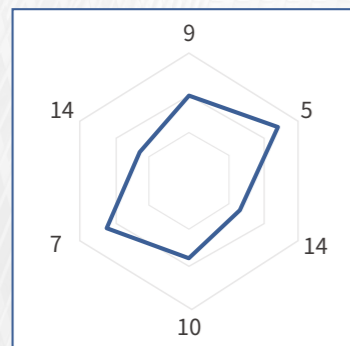
Overall Ranking 19 / Domestic Ranking 14

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	36 (14)	16 (15)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	29 (16)	19 (11)

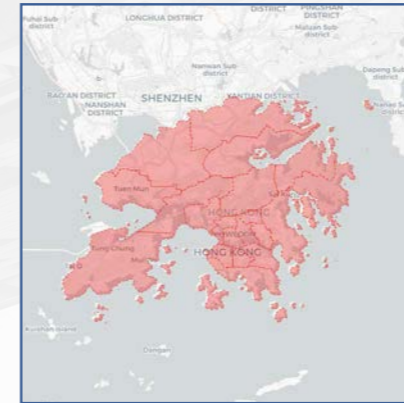
### Overall Ranking



### Domestic Ranking



## 31 Hong Kong



### Economic Pillar 64.73

Overall Ranking 22 / Domestic Ranking 2

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	22 (2)	21 (1)

### Innovation Pillar 53.08

Overall Ranking 48 / Domestic Ranking 22

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	49 (22)	32 (14)

### Culture Pillar 84.35

Overall Ranking 11 / Domestic Ranking 1

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	26 (6)	3 (1)	22 (1)

### Environment Pillar 75.91

Overall Ranking 31 / Domestic Ranking 7

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	19 (5)	36 (10)

### Social Welfare Pillar 69.64

Overall Ranking 14 / Domestic Ranking 1

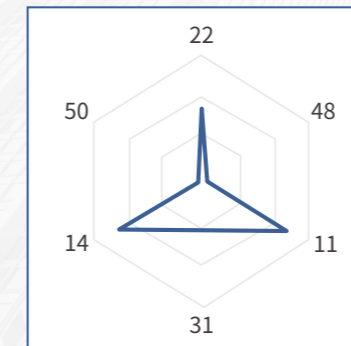
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	27 (1)	21 (7)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	49 (23)	2 (1)

### Life Burden Pillar 50.00

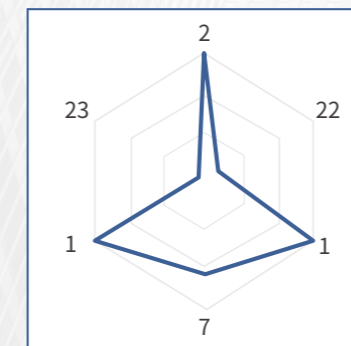
Overall Ranking 50 / Domestic Ranking 23

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	50 (23)	39 (23)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	36 (21)	2 (1)

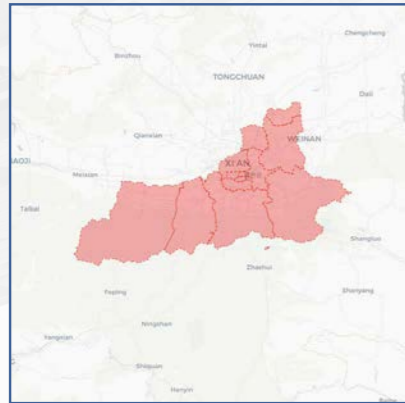
### Overall Ranking



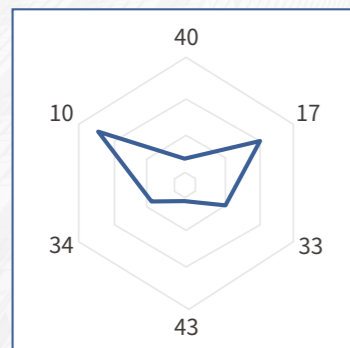
### Domestic Ranking



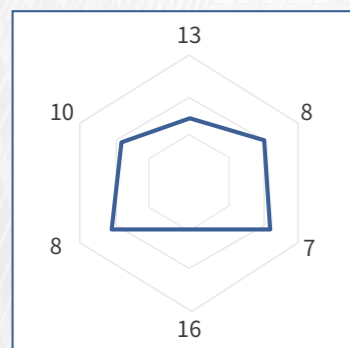
## 32 Xi'an



### Overall Ranking



### Domestic Ranking



### Economic Pillar 55.59

Overall Ranking 40 / Domestic Ranking 13

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	40 (13)	44 (17)

### Innovation Pillar 72.96

Overall Ranking 17 / Domestic Ranking 8

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	3 (2)	25 (10)

### Culture Pillar 63.27

Overall Ranking 33 / Domestic Ranking 7

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	25 (5)	37 (10)	42 (15)

### Environment Pillar 62.25

Overall Ranking 43 / Domestic Ranking 16

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	34 (15)	48 (21)

### Social Welfare Pillar 56.82

Overall Ranking 34 / Domestic Ranking 8

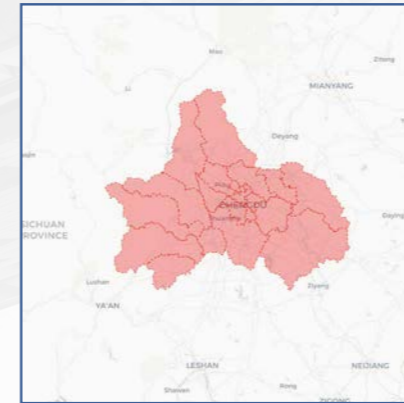
Sub-indicators	Monthly Income	Government Education Expenditure
	45 (19)	15 (4)
Overall (Domestic)	Physician Density	Insurance Density
	33 (16)	45 (20)

### Life Burden Pillar 91.38

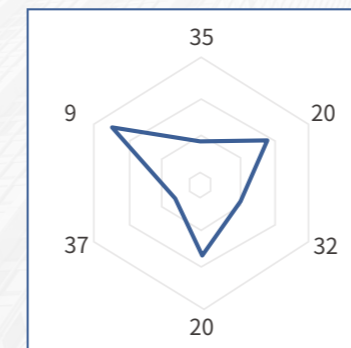
Overall Ranking 10 / Domestic Ranking 10

Sub-indicators	Housing Burden	Living Cost Index
	31 (11)	5 (5)
Overall (Domestic)	Commuting Time	Safety Index
	16 (7)	16 (8)

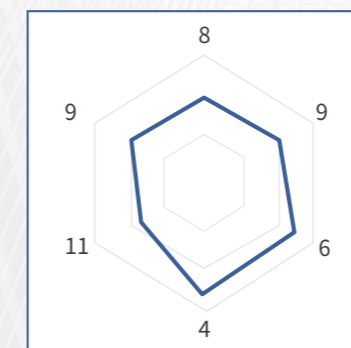
## 33 Chengdu



### Overall Ranking



### Domestic Ranking



### Economic Pillar 57.91

Overall Ranking 35 / Domestic Ranking 8

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	32 (8)	42 (15)

### Innovation Pillar 69.63

Overall Ranking 20 / Domestic Ranking 9

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	30 (13)	17 (8)

### Culture Pillar 65.14

Overall Ranking 32 / Domestic Ranking 6

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	12 (4)	40 (13)	45 (18)

### Environment Pillar 80.26

Overall Ranking 20 / Domestic Ranking 4

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	7 (2)	29 (7)

### Social Welfare Pillar 55.98

Overall Ranking 37 / Domestic Ranking 11

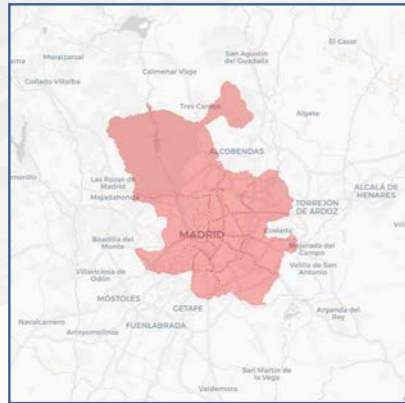
Sub-indicators	Monthly Income	Government Education Expenditure
	40 (14)	21 (7)
Overall (Domestic)	Physician Density	Insurance Density
	27 (11)	40 (15)

### Life Burden Pillar 91.85

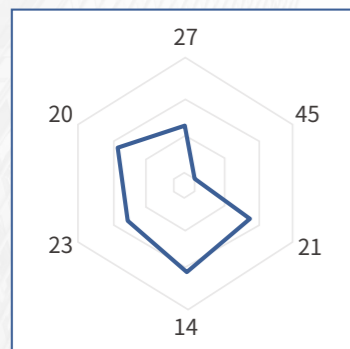
Overall Ranking 9 / Domestic Ranking 9

Sub-indicators	Housing Burden	Living Cost Index
	27 (9)	15 (14)
Overall (Domestic)	Commuting Time	Safety Index
	29 (16)	20 (12)

## 34 Madrid



### Overall Ranking



### Economic Pillar 62.62

Overall Ranking 27

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	27	26

### Innovation Pillar 56.02

Overall Ranking 45

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	44	32

### Culture Pillar 76.92

Overall Ranking 21

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	11	15	22

### Environment Pillar 83.60

Overall Ranking 14

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	12	19

### Social Welfare Pillar 63.37

overall ranking 23

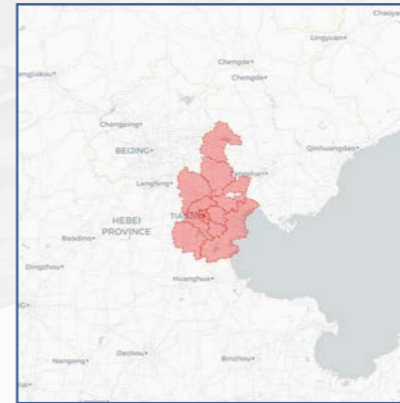
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	25	50
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	3	29

### Life Burden Pillar 84.04

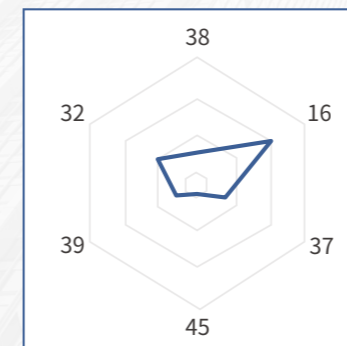
Overall Ranking 20

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	29	24
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	21	11

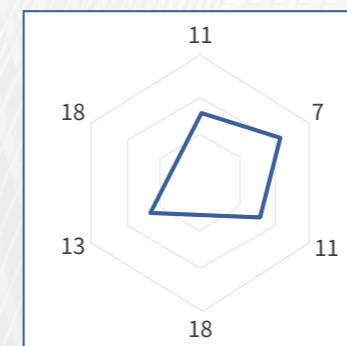
## 35 Tianjin



### Overall Ranking



### Domestic Ranking



### Economic Pillar 56.74

Overall Ranking 38 / Domestic Ranking 11

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	36 (11)	43 (16)

### Innovation Pillar 73.40

Overall Ranking 16 / Domestic Ranking 7

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	17 (6)	13 (7)

### Culture Pillar 58.73

Overall Ranking 37 / Domestic Ranking 11

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	39 (13)	33 (6)	31 (5)

### Environment Pillar 60.33

Overall Ranking 45 / Domestic Ranking 18

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	41 (18)	46 (19)

### Social Welfare Pillar 55.50

Overall Ranking 39 / Domestic Ranking 13

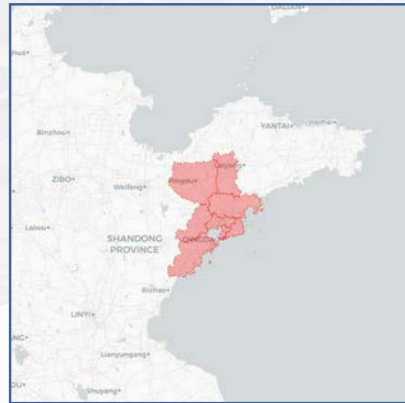
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	42 (16)	24 (10)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	26 (10)	42 (17)

### Life Burden Pillar 74.67

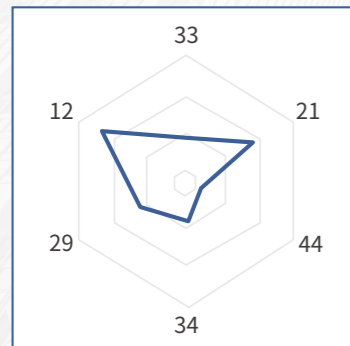
Overall Ranking 32 / Domestic Ranking 18

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	45 (18)	13 (12)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	29 (16)	15 (7)

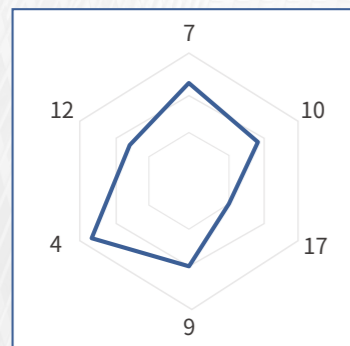
## 36 Qingdao



### Overall Ranking



### Domestic Ranking



### Economic Pillar 58.12

Overall Ranking 33 / Domestic Ranking 7

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	31 (7)	36 (9)

### Innovation Pillar 69.15

Overall Ranking 21 / Domestic Ranking 10

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	34 (16)	17 (8)

### Culture Pillar 57.38

Overall Ranking 44 / Domestic Ranking 17

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	40 (14)	36 (9)	43 (16)

### Environment Pillar 75.14

Overall Ranking 34 / Domestic Ranking 9

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	35 (16)	21 (4)

### Social Welfare Pillar 58.51

Overall Ranking 29 / Domestic Ranking 4

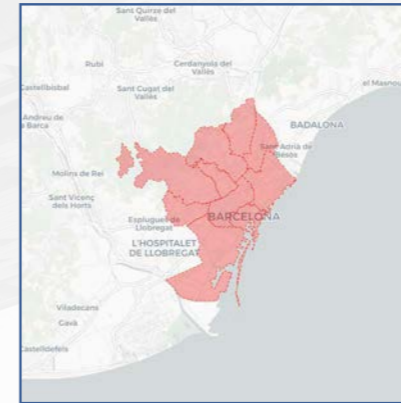
Sub-indicators	Monthly Income	Government Education Expenditure
	36 (10)	13 (2)
Overall (Domestic)	Physician Density	Insurance Density
	18 (6)	39 (14)

### Life Burden Pillar 89.98

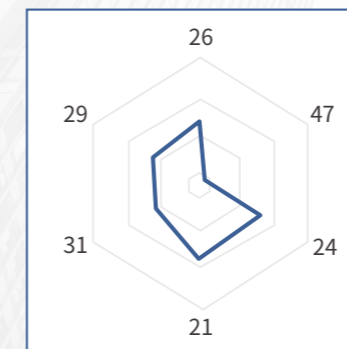
Overall Ranking 12 / Domestic Ranking 12

Sub-indicators	Housing Burden	Living Cost Index
	33 (13)	2 (2)
Overall (Domestic)	Commuting Time	Safety Index
	29 (16)	21 (13)

## 37 Barcelona



### Overall Ranking



### Economic Pillar 62.64

Overall Ranking 26

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	28	24

### Innovation Pillar 55.07

Overall Ranking 47

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	45	32

### Culture Pillar 73.71

Overall Ranking 24

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	19	18	27

### Environment Pillar 80.14

Overall Ranking 21

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	4	32

### Social Welfare Pillar 58.01

Overall Ranking 31

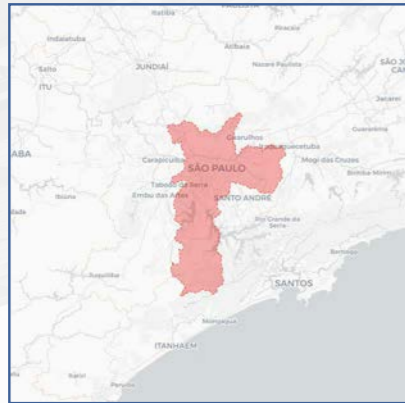
Sub-indicators	Monthly Income	Government Education Expenditure
	26	47
Overall Ranking	Physician Density	Insurance Density
	8	25

### Life Burden Pillar 76.00

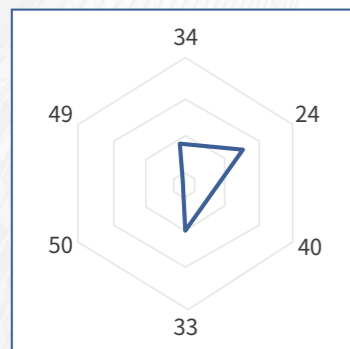
Overall Ranking 29

Sub-indicators	Housing Burden	Living Cost Index
	35	25
Overall Ranking	Commuting Time	Safety Index
	8	40

## 38 Sao Paulo



### Overall Ranking



### Economic Pillar 58.06

Overall Ranking 34

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall Ranking	39	32

### Innovation Pillar 67.14

Overall Ranking 24

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall Ranking	46	16

### Culture Pillar 57.82

Overall Ranking 40

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall Ranking	44	28	33

### Environment Pillar 75.36

Overall Ranking 33

Sub-indicators	Climate Index	Pollution Index
Overall Ranking	1	43

### Social Welfare Pillar 50.00

Overall Ranking 50

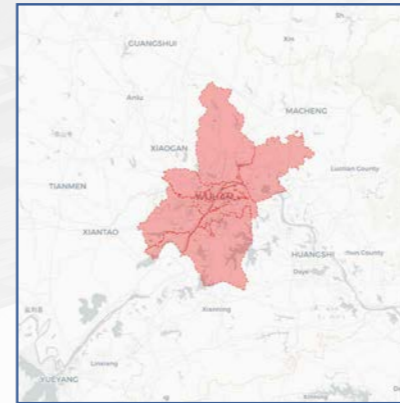
Sub-indicators	Monthly Income	Government Education Expenditure
Overall Ranking	50	46
Sub-indicators	Physician Density	Insurance Density
Overall Ranking	40	50

### Life Burden Pillar 51.93

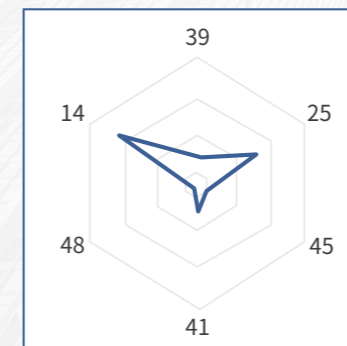
Overall Ranking 49

Sub-indicators	Housing Burden	Living Cost Index
Overall Ranking	44	37
Sub-indicators	Commuting Time	Safety Index
Overall Ranking	48	50

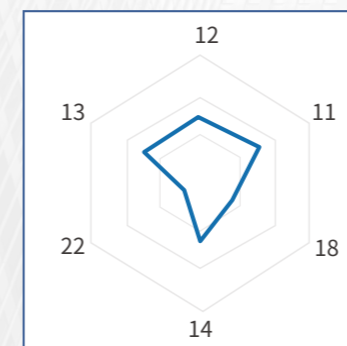
## 39 Wuhan



### Overall Ranking



### Domestic Ranking



### Economic Pillar 56.36

Overall Ranking 39 / Domestic Ranking 12

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	38 (12)	30 (5)

### Innovation Pillar 66.31

Overall Ranking 25 / Domestic Ranking 11

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	20 (8)	25 (10)

### Culture Pillar 56.67

Overall Ranking 45 / Domestic Ranking 18

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	45 (18)	38 (11)	40 (13)

### Environment Pillar 66.80

Overall Ranking 41 / Domestic Ranking 14

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	22 (7)	47 (20)

### Social Welfare Pillar 51.07

Overall Ranking 48 / Domestic Ranking 22

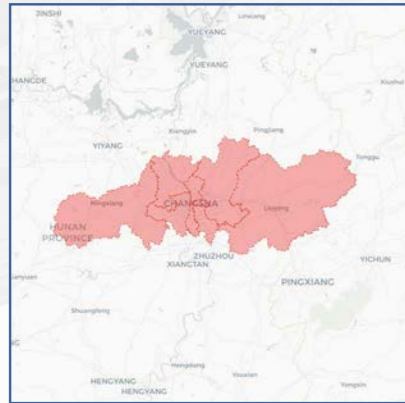
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	38 (12)	49 (23)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	28 (12)	34 (9)

### Life Burden Pillar 87.46

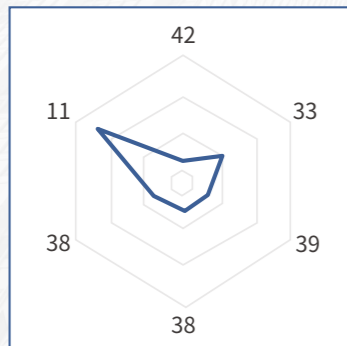
Overall Ranking 14 / Domestic Ranking 13

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	32 (12)	19 (18)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	27 (14)	14 (6)

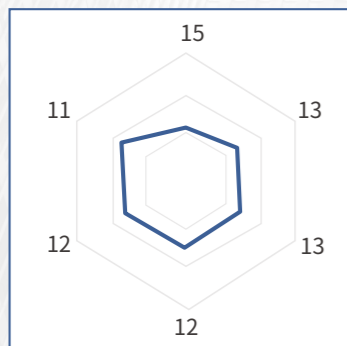
## 40 Changsha



### Overall Ranking



### Domestic Ranking



### Economic Pillar 55.01

Overall Ranking 42 / Domestic Ranking 15

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	42 (15)	37 (10)

### Innovation Pillar 62.67

Overall Ranking 33 / Domestic Ranking 13

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	29 (12)	29 (13)

### Culture Pillar 58.51

Overall Ranking 39 / Domestic Ranking 13

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	36 (11)		47 (20)

### Environment Pillar 69.95

Overall Ranking 38 / Domestic Ranking 12

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	22 (7)	44 (17)

### Social Welfare Pillar 55.58

Overall Ranking 38 / Domestic Ranking 12

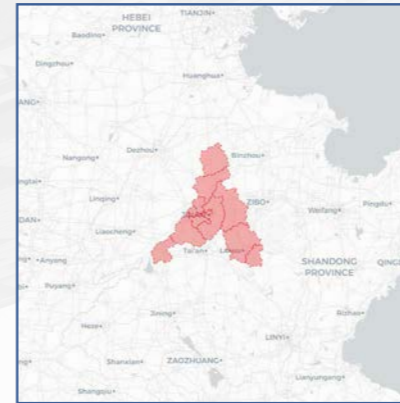
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	35 (9)	23 (9)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	32 (15)	38 (13)

### Life Burden Pillar 91.34

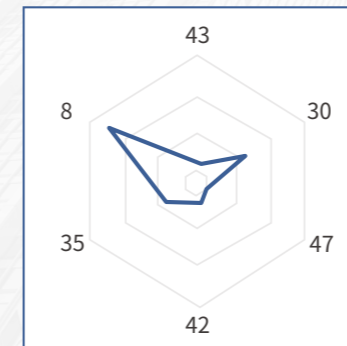
Overall Ranking 11 / Domestic Ranking 11

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	26 (8)	21 (20)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	9 (4)	13 (5)

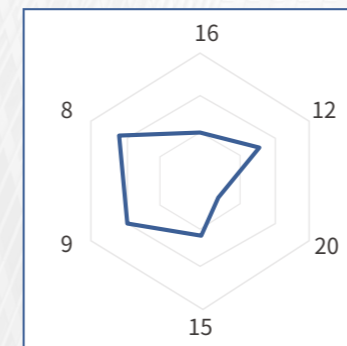
## 41 Jinan



### Overall Ranking



### Domestic Ranking



### Economic Pillar 54.32

Overall Ranking 43 / Domestic Ranking 16

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	43 (16)	38 (11)

### Innovation Pillar 63.68

Overall Ranking 30 / Domestic Ranking 12

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	35 (17)	25 (10)

### Culture Pillar 55.58

Overall Ranking 47 / Domestic Ranking 20

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	47 (20)	44 (17)	43 (16)

### Environment Pillar 64.24

Overall Ranking 42 / Domestic Ranking 15

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	38 (17)	41 (15)

### Social Welfare Pillar 56.36

Overall Ranking 35 / Domestic Ranking 9

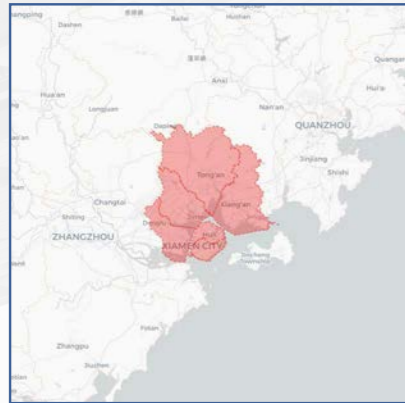
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	37 (11)	33 (15)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	14 (3)	35 (10)

### Life Burden Pillar 92.41

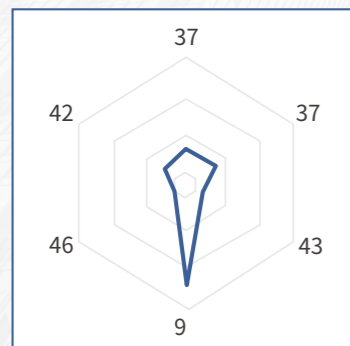
Overall Ranking 8 / Domestic Ranking 8

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	30 (10)	4 (4)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	9 (4)	25 (15)

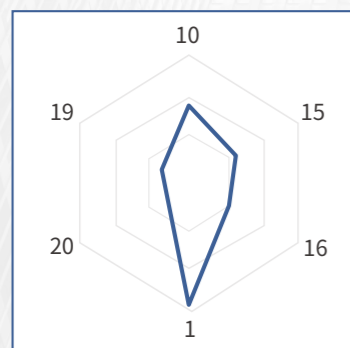
## 42 Xiamen



### Overall Ranking



### Domestic Ranking



### Economic Pillar 57.51

Overall Ranking 37 / Domestic Ranking 10

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	34 (9)	39 (12)

### Innovation Pillar 60.89

Overall Ranking 37 / Domestic Ranking 15

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	23 (10)	42 (18)

### Culture Pillar 57.40

Overall Ranking 43 / Domestic Ranking 16

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	41 (15)	41 (14)	41 (14)

### Environment Pillar 88.49

Overall Ranking 9 / Domestic Ranking 1

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	15 (3)	15 (2)

### Social Welfare Pillar 52.19

Overall Ranking 46 / Domestic Ranking 20

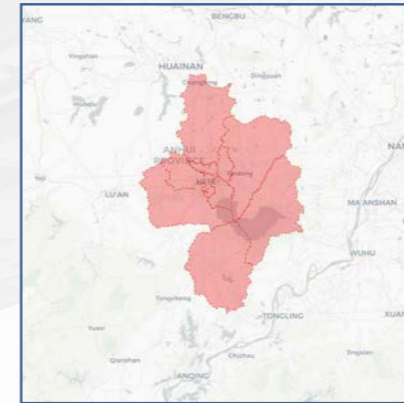
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	34 (8)	42 (20)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	35 (17)	44 (19)

### Life Burden Pillar 67.14

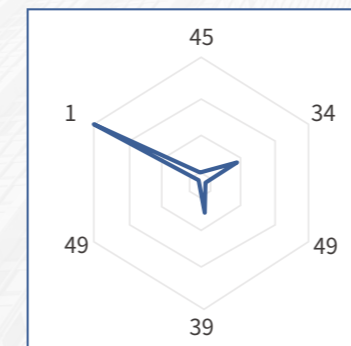
Overall Ranking 42 / Domestic Ranking 19

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	47 (20)	18 (17)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	5 (2)	29 (19)

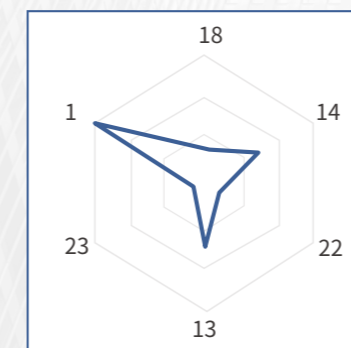
## 43 Hefei



### Overall Ranking



### Domestic Ranking



### Economic Pillar 52.54

Overall Ranking 45 / Domestic Ranking 18

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	45 (18)	41 (14)

### Innovation Pillar 62.28

Overall Ranking 34 / Domestic Ranking 14

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	22 (9)	32 (14)

### Culture Pillar 53.26

Overall Ranking 49 / Domestic Ranking 22

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	49 (22)	43 (16)	48 (21)

### Environment Pillar 69.78

Overall Ranking 39 / Domestic Ranking 13

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	29 (11)	42 (16)

### Social Welfare Pillar 50.91

Overall Ranking 49 / Domestic Ranking 23

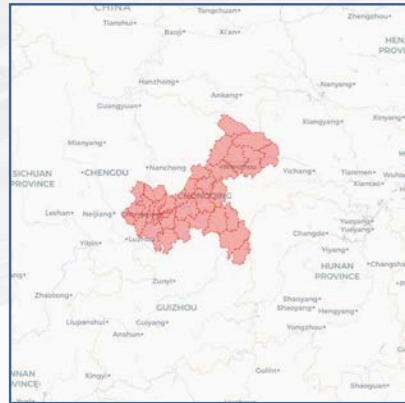
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	39 (13)	45 (22)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	38 (19)	43 (18)

### Life Burden Pillar 100.00

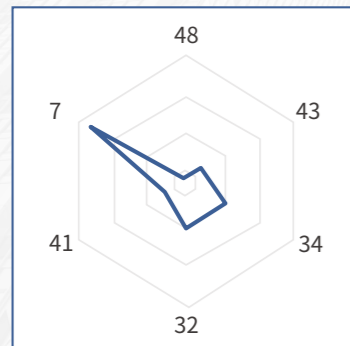
Overall Ranking 1 / Domestic Ranking 1

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	21 (5)	1 (1)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	6 (3)	21 (13)

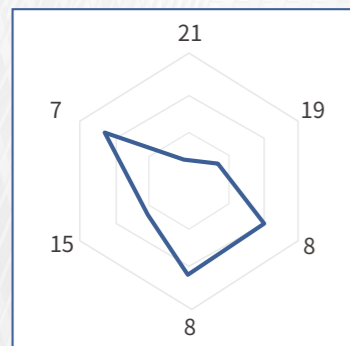
## 44 Chongqing



### Overall Ranking



### Domestic Ranking



### Economic Pillar 51.10

Overall Ranking 48 / Domestic Ranking 21

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	49 (22)	45 (18)

### Innovation Pillar 57.35

Overall Ranking 43 / Domestic Ranking 19

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	40 (20)	32 (14)

### Culture Pillar 61.51

Overall Ranking 34 / Domestic Ranking 8

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	29 (8)	45 (18)	46 (19)

### Environment Pillar 75.75

Overall Ranking 32 / Domestic Ranking 8

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	6 (1)	38 (12)

### Social Welfare Pillar 55.07

Overall Ranking 41 / Domestic Ranking 15

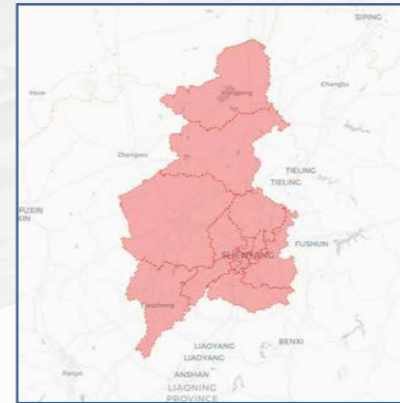
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	48 (22)	20 (6)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	42 (21)	49 (23)

### Life Burden Pillar 93.27

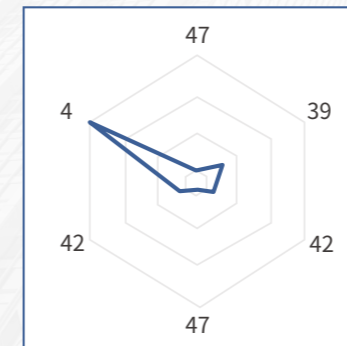
Overall Ranking 7 / Domestic Ranking 7

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	24 (7)	9 (9)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	34 (20)	29 (19)

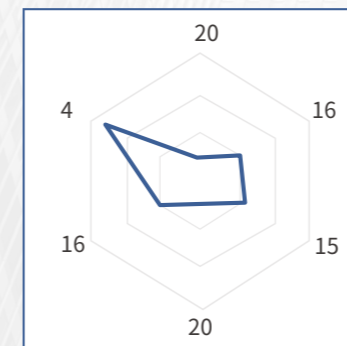
## 45 Shenyang



### Overall Ranking



### Domestic Ranking



### Economic Pillar 51.93

Overall Ranking 47 / Domestic Ranking 20

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	47 (20)	47 (20)

### Innovation Pillar 59.54

Overall Ranking 39 / Domestic Ranking 16

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	31 (14)	42 (18)

### Culture Pillar 57.44

Overall Ranking 42 / Domestic Ranking 15

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	43 (17)	33 (6)	34 (7)

### Environment Pillar 55.87

Overall Ranking 47 / Domestic Ranking 20

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	48 (21)	30 (8)

### Social Welfare Pillar 54.55

Overall Ranking 42 / Domestic Ranking 16

Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	41 (15)	35 (16)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	24 (9)	32 (7)

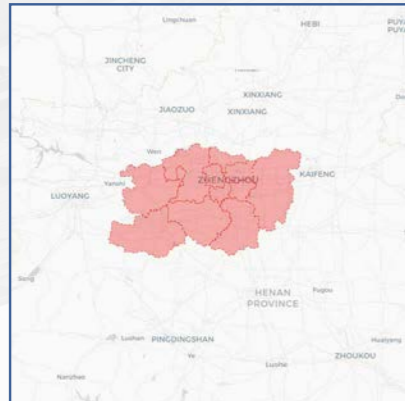
### Life Burden Pillar 96.46

Overall Ranking 4 / Domestic Ranking 4

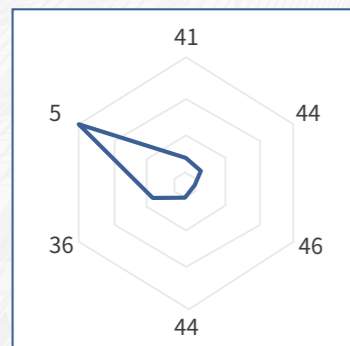
Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	17 (3)	14 (13)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	16 (7)	27 (17)



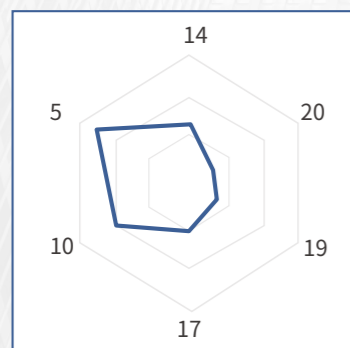
## 46 Zhengzhou



### Overall Ranking



### Domestic Ranking



### Economic Pillar 55.55

Overall Ranking 41 / Domestic Ranking 14

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	41 (14)	40 (13)

### Innovation Pillar 56.83

Overall Ranking 44 / Domestic Ranking 20

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	39 (19)	42 (18)

### Culture Pillar 56.06

Overall Ranking 46 / Domestic Ranking 19

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	46 (19)	46 (19)	49 (22)

### Environment Pillar 60.84

Overall Ranking 44 / Domestic Ranking 17

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	33 (14)	49 (22)

### Social Welfare Pillar 56.04

Overall Ranking 36 / Domestic Ranking 10

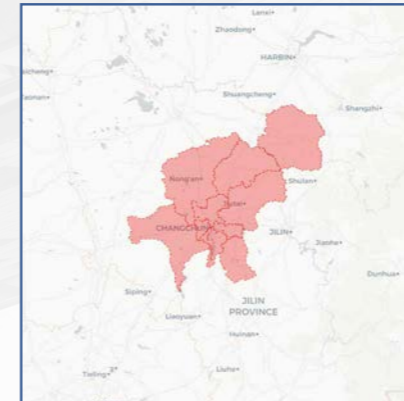
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	46 (20)	30 (13)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	17 (5)	37 (12)

### Life Burden Pillar 96.28

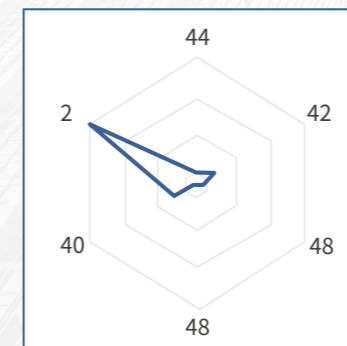
Overall Ranking 5 / Domestic Ranking 5

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	22 (6)	8 (8)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	24 (12)	18 (10)

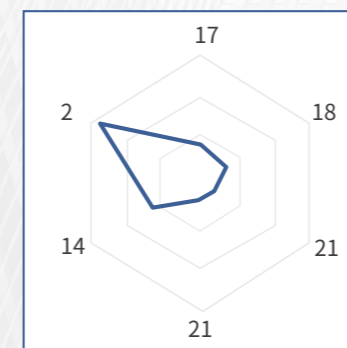
## 47 Changchun



### Overall Ranking



### Domestic Ranking



### Economic Pillar 53.19

Overall Ranking 44 / Domestic Ranking 17

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	44 (17)	48 (21)

### Innovation Pillar 57.63

Overall Ranking 42 / Domestic Ranking 18

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	38 (18)	32 (14)

### Culture Pillar 54.80

Overall Ranking 48 / Domestic Ranking 21

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	48 (21)	49 (22)	39 (12)

### Environment Pillar 54.44

Overall Ranking 48 / Domestic Ranking 21

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	49 (22)	26 (5)

### Social Welfare Pillar 55.08

Overall Ranking 40 / Domestic Ranking 14

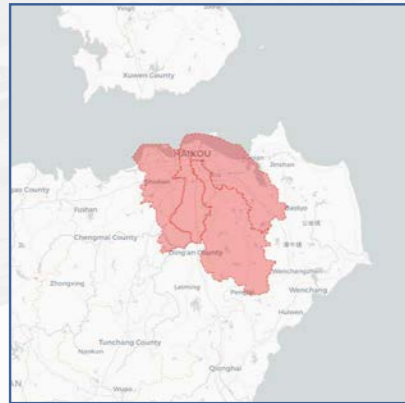
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	49 (23)	31 (14)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	22 (7)	48 (22)

### Life Burden Pillar 99.84

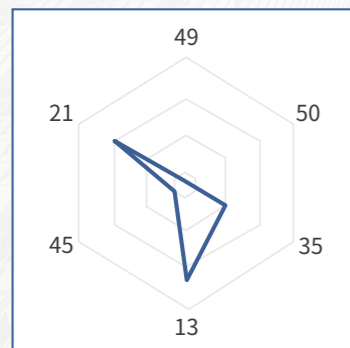
Overall Ranking 4 / Domestic Ranking 4

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	7 (1)	12 (11)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	16 (7)	28 (18)

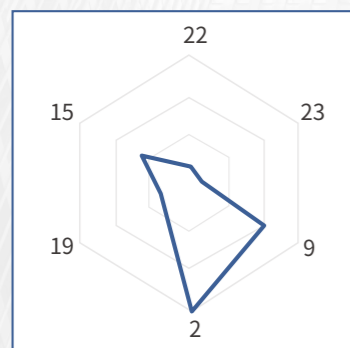
## 48 Haikou



### Overall Ranking



### Domestic Ranking



### Economic Pillar 50.79

Overall Ranking 49 / Domestic Ranking 22

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	48 (21)	49 (22)

### Innovation Pillar 50.00

Overall Ranking 50 / Domestic Ranking 23

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	50 (23)	42 (18)

### Culture Pillar 61.23

Overall Ranking 35 / Domestic Ranking 9

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	31 (9)	42 (15)	37 (10)

### Environment Pillar 86.69

Overall Ranking 13 / Domestic Ranking 2

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	31 (13)	14 (1)

### Social Welfare Pillar 52.90

Overall Ranking 45 / Domestic Ranking 19

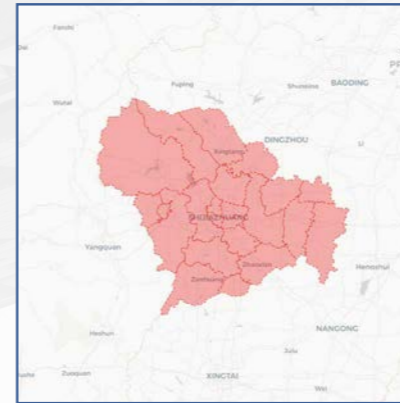
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	44 (18)	44 (21)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	23 (8)	36 (11)

### Life Burden Pillar 83.59

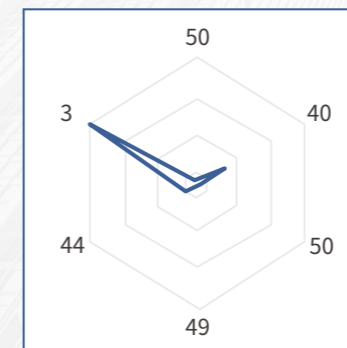
Overall Ranking 21 / Domestic Ranking 15

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	41 (15)	3 (3)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	4 (1)	17 (9)

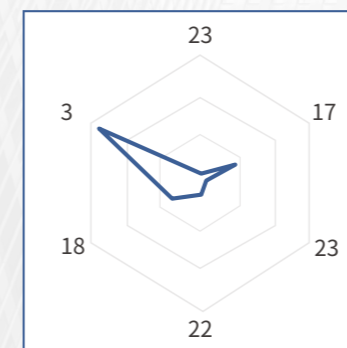
## 49 Shijiazhuang



### Overall Ranking



### Domestic Ranking



### Economic Pillar 50.00

Overall Ranking 50 / Domestic Ranking 23

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	50 (23)	50 (23)

### Innovation Pillar 59.26

Overall Ranking 40 / Domestic Ranking 17

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	32 (15)	42 (18)

### Culture Pillar 50.00

Overall Ranking 50 / Domestic Ranking 23

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	50 (23)	46 (19)	50 (23)

### Environment Pillar 51.35

Overall Ranking 49 / Domestic Ranking 22

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	42 (19)	50 (23)

### Social Welfare Pillar 53.05

Overall Ranking 44 / Domestic Ranking 18

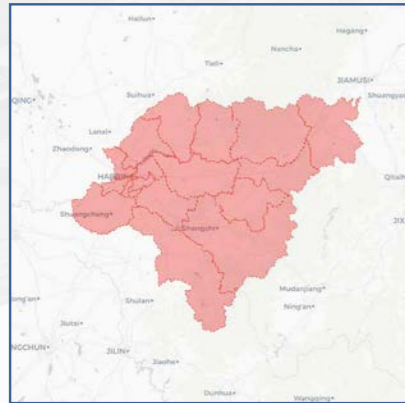
Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	47 (21)	36 (17)
Sub-indicators	Physician Density	Insurance Density
Overall (Domestic)	35 (17)	41 (16)

### Life Burden Pillar 99.33

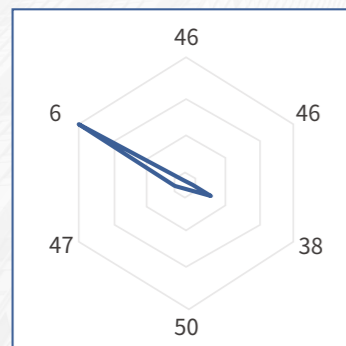
Overall Ranking 3 / Domestic Ranking 3

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	9 (2)	7 (7)
Sub-indicators	Commuting Time	Safety Index
Overall (Domestic)	14 (6)	33 (22)

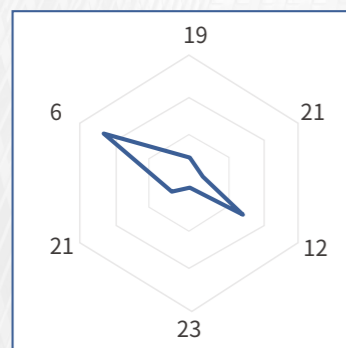
## 50 Harbin



### Overall Ranking



### Domestic Ranking



### Economic Pillar 52.07

Overall Ranking 46 / Domestic Ranking 19

Sub-indicators	VIIRS Nighttime Light Data	Labor Productivity
Overall (Domestic)	46 (19)	46 (19)

### Innovation Pillar 55.51

Overall Ranking 46 / Domestic Ranking 21

Sub-indicators	R&D Intensity	Number of Unicorn Companies
Overall (Domestic)	43 (21)	42 (18)

### Culture Pillar 58.69

Overall Ranking 38 / Domestic Ranking 12

Sub-indicators	City Connectivity	Foreign Proportion	International Student Proportion
Overall (Domestic)	37 (12)	49 (22)	38 (11)

### Environment Pillar 50.00

Overall Ranking 50 / Domestic Ranking 23

Sub-indicators	Climate Index	Pollution Index
Overall (Domestic)	50 (23)	34 (9)

### Social Welfare Pillar 51.62

Overall Ranking 47 / Domestic Ranking 21

Sub-indicators	Monthly Income	Government Education Expenditure
Overall (Domestic)	43 (17)	40 (19)
	Physician Density	Insurance Density
	43 (22)	46 (21)

### Life Burden Pillar 94.92

Overall Ranking 6 / Domestic Ranking 6

Sub-indicators	Housing Burden	Living Cost Index
Overall (Domestic)	20 (4)	6 (6)
	Commuting Time	Safety Index
	16 (7)	34 (23)

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### Beijing Institute of Talent Development Strategy

Beijing Institute of Talent Development Strategy (BITS) is a new research and development institution in Beijing. It adheres to the philosophy of "openness, innovation, and pragmatism", positioned as a "strategic research think tank, international cooperation window, academic exchange platform, talent cultivation base, and talent data center". At present, BITS has set up a research team with a solid professional foundation and multidisciplinary academic background, including 14 full-time researchers and more than 30 part-time expert consultants. Our research team is engaged in cadres and talents decision-making consultation, policy effectiveness evaluation, and international exchanges and cooperation, striving to build a world's high-end think tank in the area of talent.

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**Gao Junjie**  
Renmin University of China  
Doctor of Finance



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