ISUI
Smart City Index
2025

The International Society for
Urban Informatics

We would like to express our sincere gratitude to the cities that are committed to the development of smart cities and the promotion of open data. We would say all selected 73 cities in our ranking are **SMART** in terms of data openness, and the success of this study has greatly benefited from the availability and accessibility of data they provide. Meanwhile, a number of other cities with sufficient open data were not selected in our case study due to the consideration of geographical representativeness.

We also aim to use our index to showcase how transparency and a willingness to share data can support evidence-based research and set a valuable example for global urban innovation. **We warmly invite cities to collaborate with us** in utilizing their data to assess their smart city development and explore further urban innovation initiatives.

ISUI Smart City index Working Group
2025.08.06

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Introduction

ISUI Smart City Index is grounded in a human-centric framework that redefines how we understand and evaluate smart urban development. Instead of relying on purely technological or data-intensive paradigms, our approach centers on how cities serve the lived experiences, needs, and well-being of their residents. By aligning the index with human-centric thinking, we aim to provide a more meaningful reflection of urban intelligence and quality of life.

Overall, this index aims not only to benchmark the smartness of cities based on publicly available and methodologically sound data, but also to reflect the **multi-dimensional, human-oriented** nature of urban development. We hope it can support cities in diagnosing their current conditions and designing pathways toward more inclusive, adaptive, and sustainable futures.

This work was carried out by researchers from The Hong Kong Polytechnic University, endorsed and published by the International Society for Urban Informatics.

Updates in ISUI Smart City Index 2025

Compared with the ISUI Smart City Index 2023, we expand the conceptual foundation of smart cities by drawing on the **core factors of city origins**, such as business, environment, social interaction, and settlements, and reframing them as the structural elements of modern smart cities. This evolution enables us to bridge historical urban functions with contemporary needs, providing a coherent and scalable framework for indicator development.

The empirical scope of the index has also been **expanded from 50 to 73 cities**, enhancing its global representativeness and enabling a richer comparative analysis across regions and city types.

To address key **gaps in international comparability**, particularly in the areas of **social exclusion** and **green public open space**, we have developed targeted evaluation methods that allow them to be more fairly assessed across diverse urban contexts and under data availability constraints.

Furthermore, we have improved the weighting methods to reduce the sensitivity to **heavy-tailed data distributions**, which are common in geographical data. Additionally, to address the scale bias that often leads to the undervaluation of large cities, we refine the treatment of **per capita indicators** by introducing more balanced calculation techniques. This approach builds on previous research showing that many urban indicators scale non-linearly with population [1] and aligns with reverse-scaling adjustments used in urban socioeconomic studies [2].

Characteristics of the Index

Human-centric nature:

We believe that the goal of smart-city development should be human-centric, that is, to improve the citizens' quality of life. Therefore, the indicators and metrics of this index are concentrated on the impact and changes that smart cities bring to the lives of citizens.

Theoretical continuity and conceptual expansion:

Rooted in the foundational understanding of what constitutes a functioning city. This index extends the core elements of traditional urban formation — such as civilization, natural environmental resources, reciprocal influence, trade, defensive facilities, and authority — into the context of smart city development, integrating contemporary technologies and planning principles. From the perspective of advancing smart city goals, we identify six key dimensions — Citizen, Environment, Social Landscape, Economy, Infrastructure, and Governance — which together form a comprehensive framework for evaluating urban smartness. These dimensions reflect both the enduring fundamentals of urban systems and the evolving aspirations of cities in the digital era.

Universal consideration in stages of urban development and culture:

We thoroughly considered the universality of the evaluation framework by selecting more internationally recognized indicators. The index also addresses the variations in the description or usage of certain indicators by applying unified conversions. This approach fully considers the applicability of the index across cities with different stages of development (e.g., in developed, developing, and newly industrialized economies) and cultures, thereby greatly reducing the geographical and cultural bias of the evaluation system.

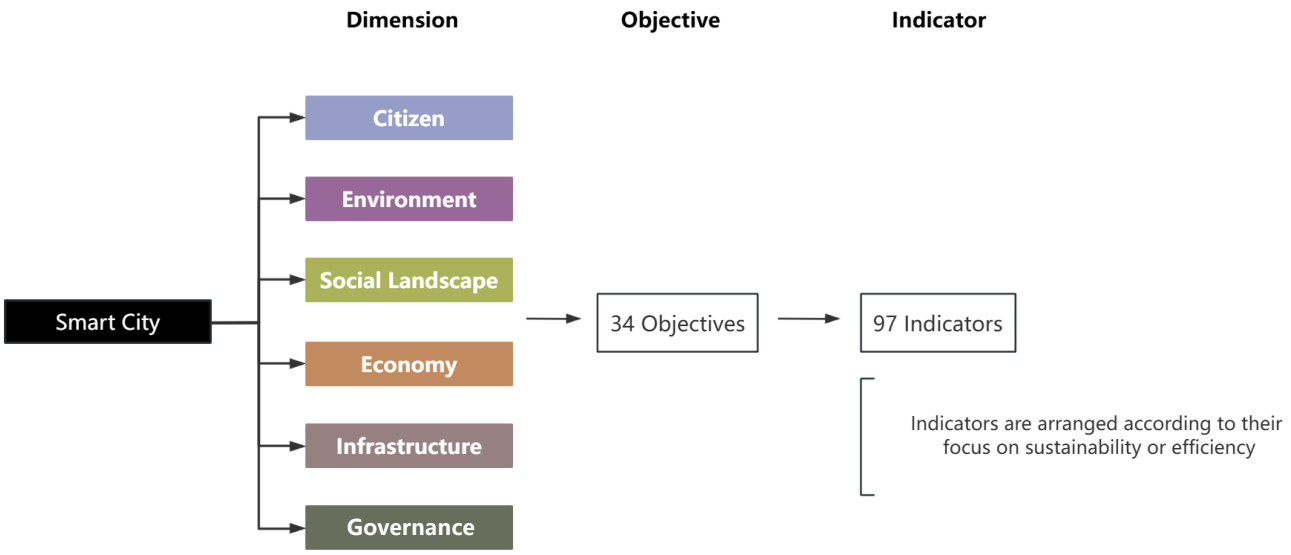
The data objectiveness and repeatability:

All data used in this index is publicly available, requiring no additional permission. Data sources that involve subjective opinions of data providers are avoided as much as possible to further improve the objectiveness of the index. As a pioneering work in the field of smart city indices, we strive to create a replicable evaluation framework for smart cities that benefits cities in assessing their progress.

The Smart City Index Framework

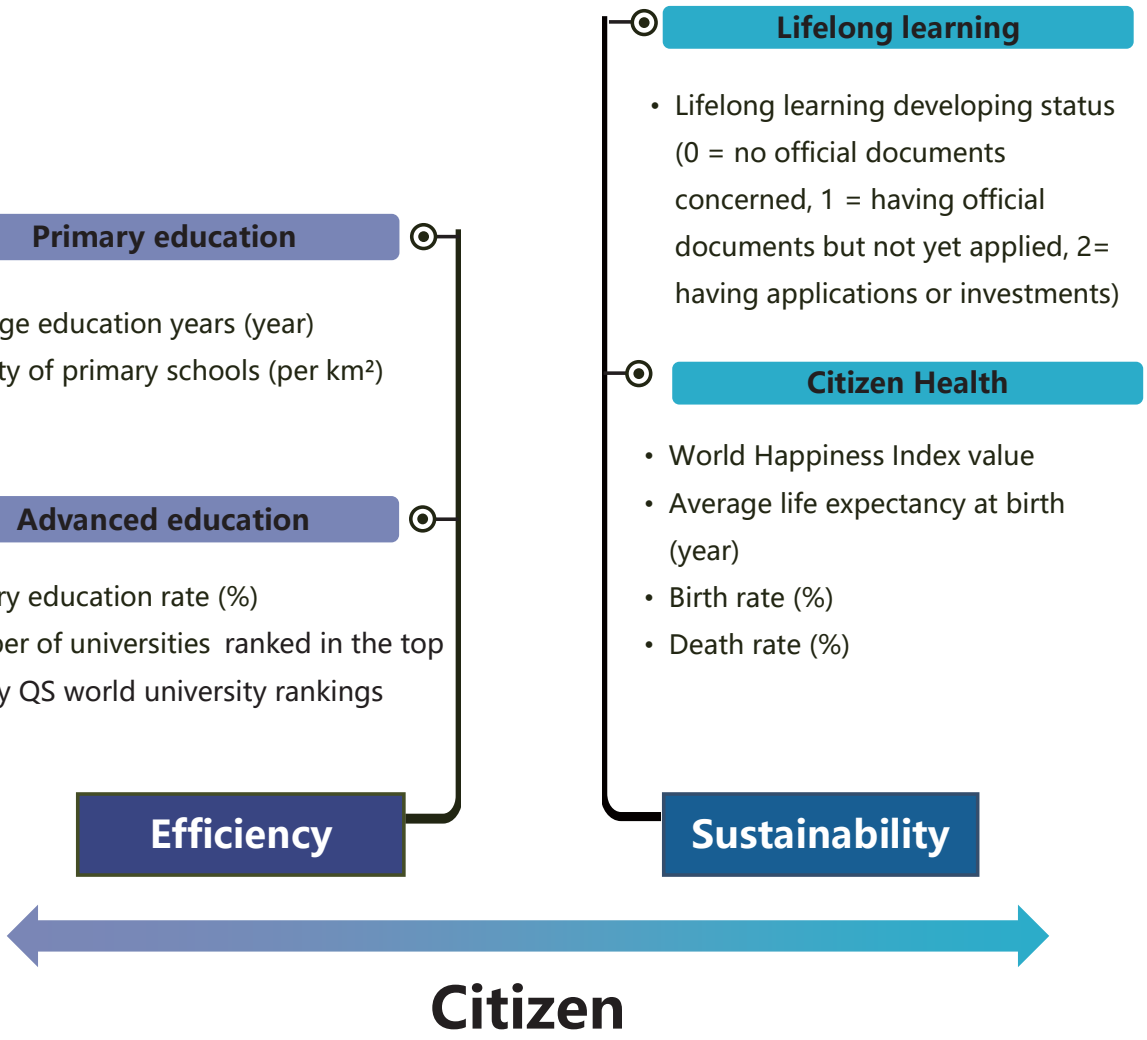
While our Smart City Index is rooted in a human-centric perspective, it does not overlook the role of innovations and technologies in urban development. Rather than evaluating cities solely based on the presence of advanced infrastructures or the adoption of emerging technologies, the index focuses on how these innovations enhance the everyday experience of residents. In this framework, a smart city is assessed in terms of its contribution to improving urban efficiency and sustainability, and more importantly, its capacity to support the well-being, inclusiveness, and quality of life of city dwellers.

The index [3] follows a hierarchical structure composed of three levels: **Dimensions**, which represent broad thematic pillars of smart city development; **Objectives**, which define specific goals within each dimension; and **Indicators**, which provide measurable evidence of progress. Indicators are conceptually organized along a spectrum from sustainability to efficiency, reflecting the dual developmental goals of a smart city. The terms “efficiency” and “sustainability” express our thinking behind the selection of indicators, while a specific indicator could belong to both goals to some extent. Whether an objective is placed under the efficiency or sustainability goal in the dimension diagrams on the following pages does not affect its weight in the evaluation score calculation.



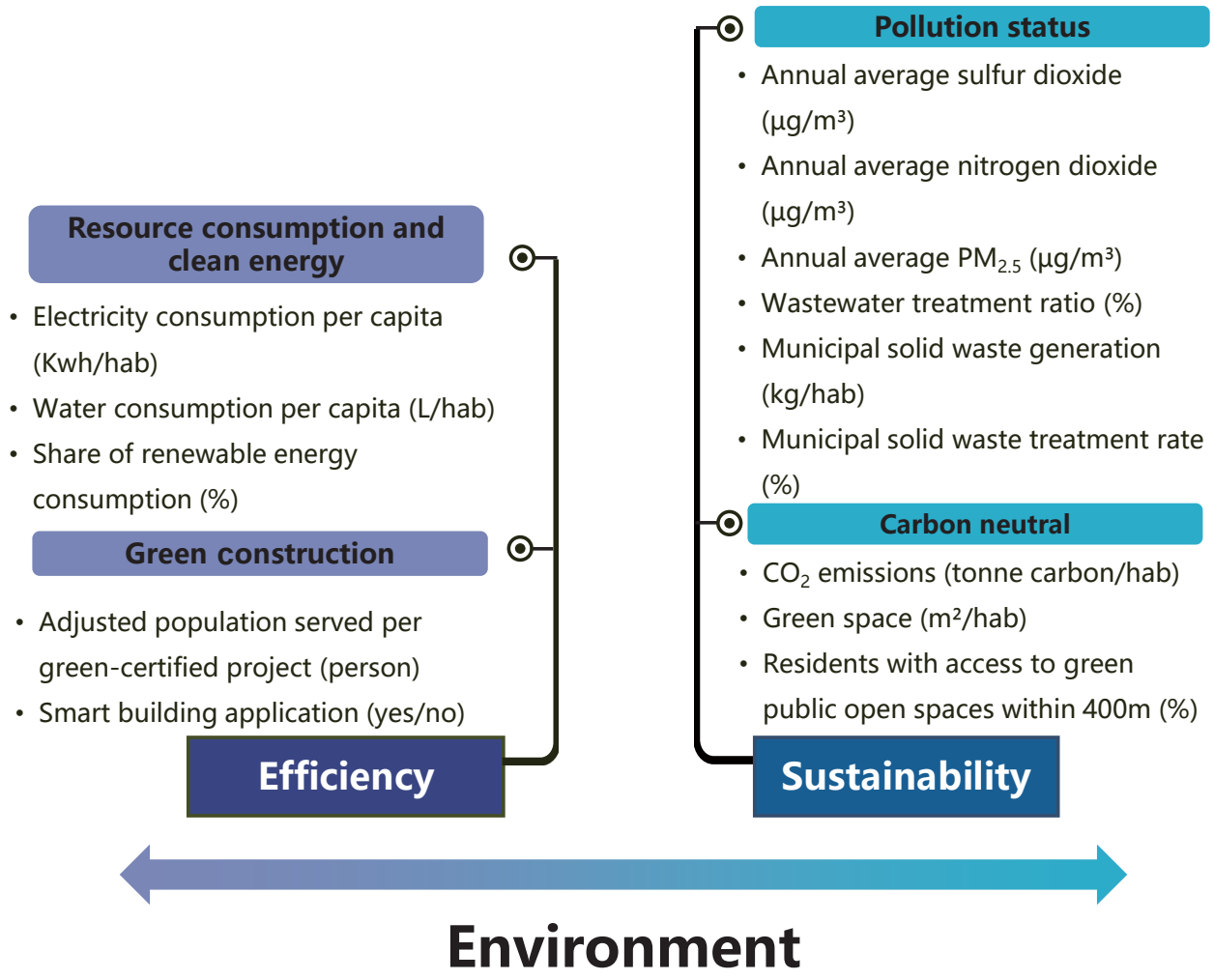
Citizen

The Citizen dimension focuses on the core aspects of how urban environments shape the lived experiences and well-being of residents. It covers key dimensions such as education and health, which are central to personal development and life satisfaction. The education component evaluates both the accessibility of educational resources and the attainment of learning outcomes across different life stages. The health component reflects the influence of urban environments on both physical and mental well-being, recognizing health as a fundamental indicator of urban livability and equity.



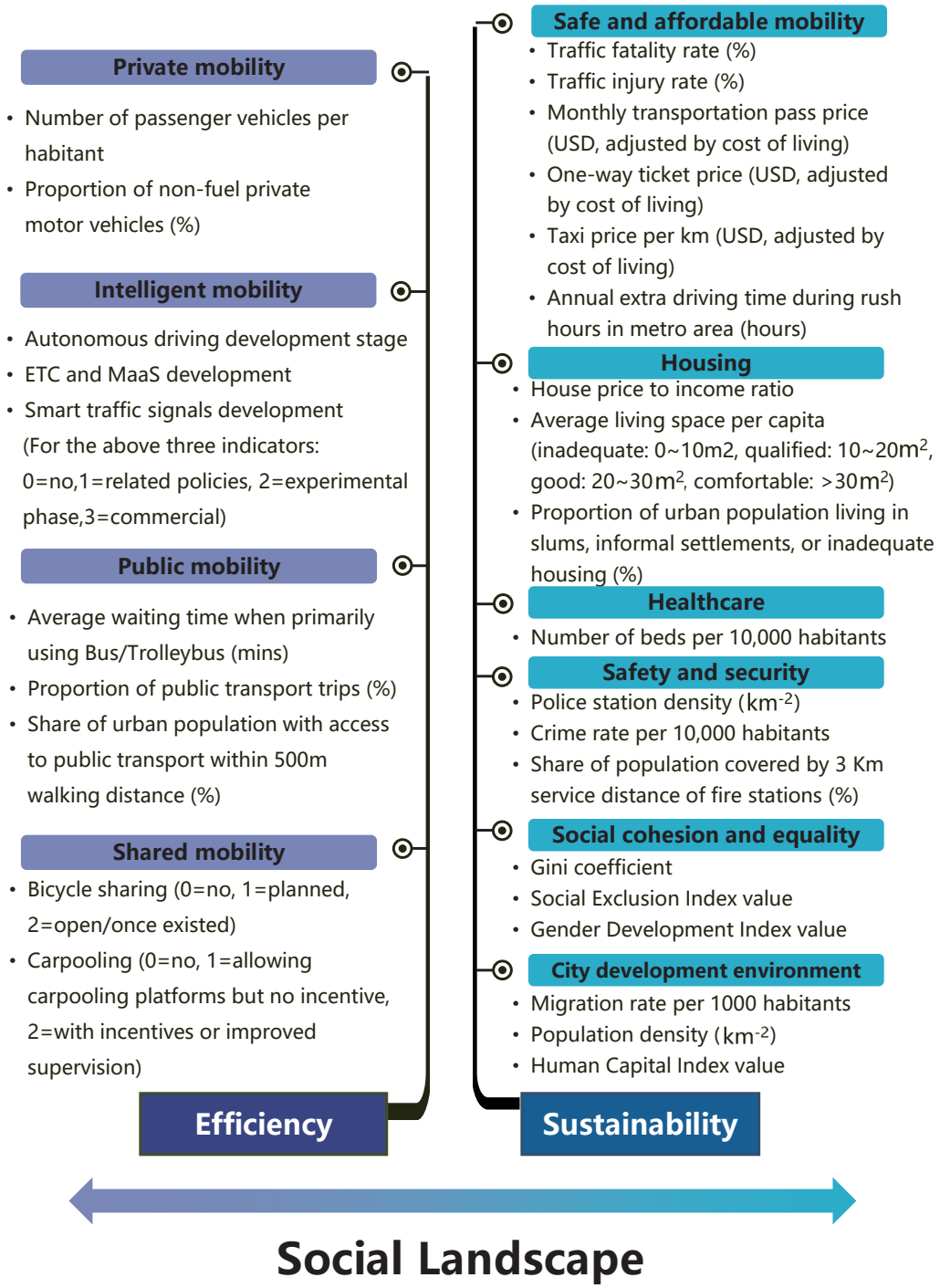
Environment

Environment focuses on resource efficiency and the pursuit of urban environmental sustainability. This dimension assesses how cities manage energy consumption and environmental protection, while also emphasizing the role of emerging technologies in fostering ecological resilience. Key areas include traditional environmental indicators such as sulfur dioxide concentration and sewage treatment rates, as well as smart solutions like green buildings and carbon neutrality strategies. The integration of innovative technologies, green energy and forward-looking policies reflects a city's capacity to build a cleaner, healthier, and more sustainable urban ecosystem.



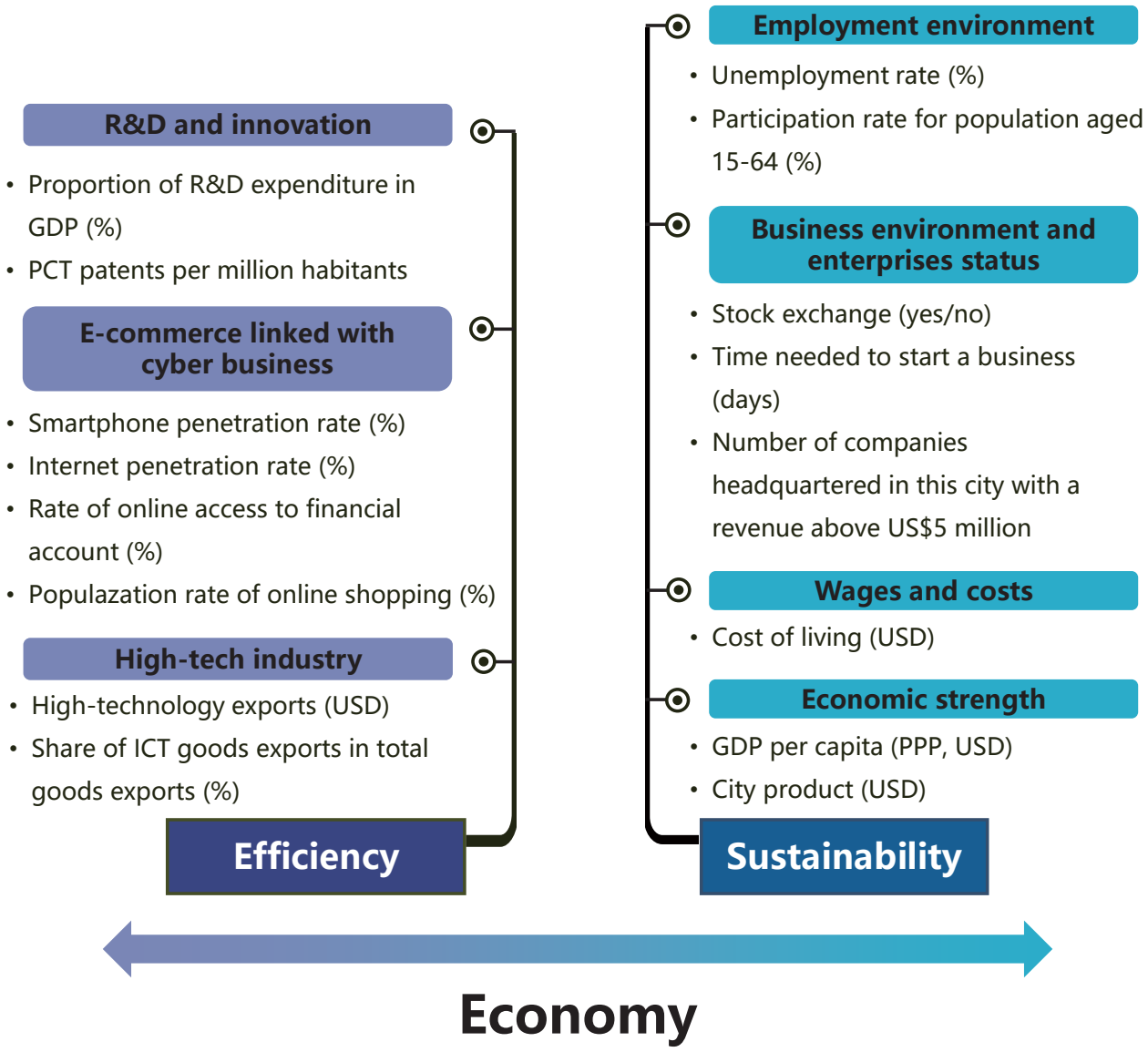
Social Landscape

Social Landscape reflects the quality, inclusiveness, and livability of a city's social environment. This dimension evaluates the extent to which cities provide a safe, convenient, and culturally vibrant environment for residents. Key areas include external conditions such as public transportation, housing, public safety, and healthcare access, as well as internal dimensions like cultural development, social equity, and overall urban attractiveness. Through this comprehensive assessment, the index captures how cities invest in building a socially sustainable and inclusive urban life.



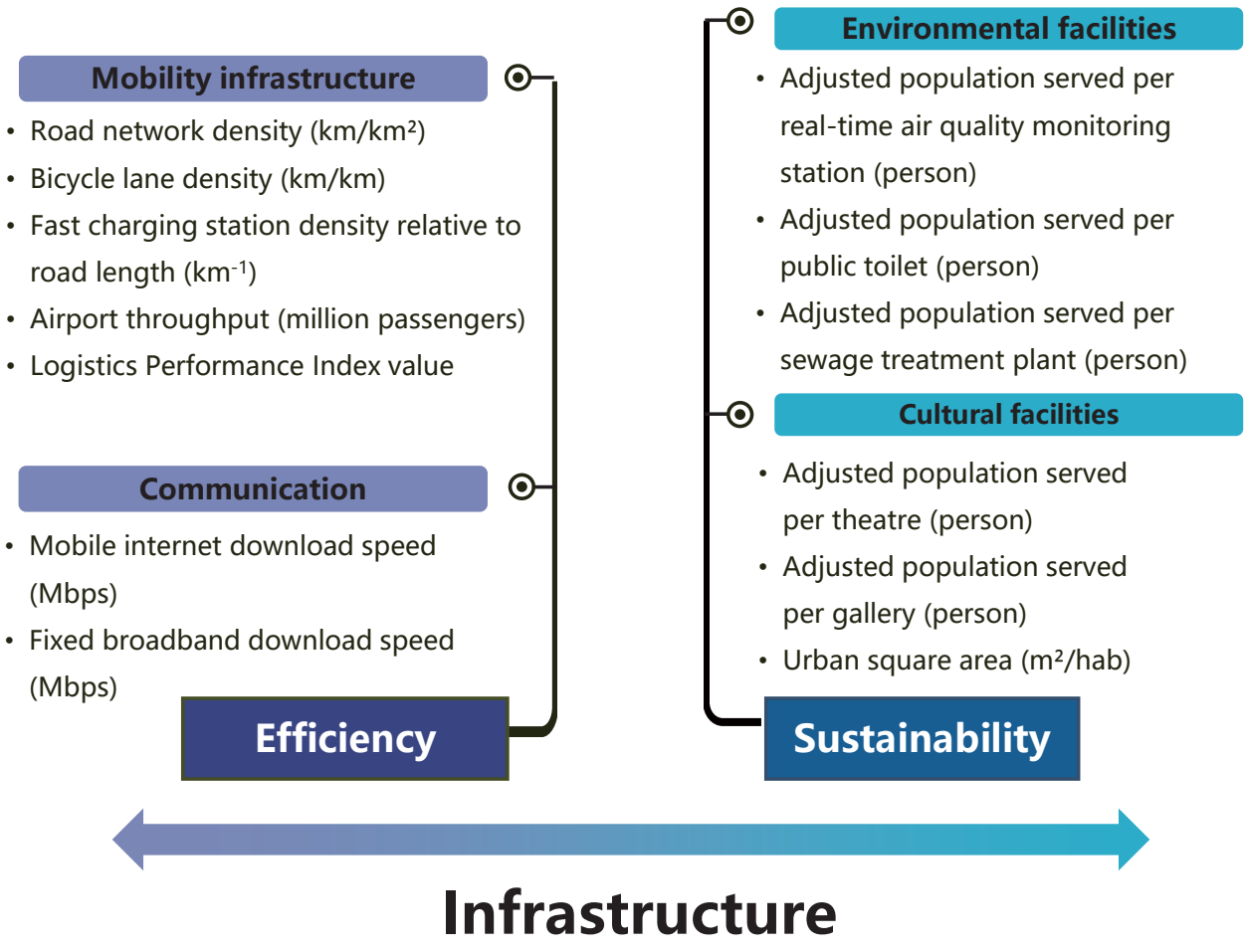
Economy

Economy is a central pillar of urban development, as it directly shapes a city's capacity for innovation, adaptability, and long-term growth. At the heart of this dimension is productivity, which serves as both an outcome and a driving force of economic transformation. This includes not only improvements in labor efficiency and industrial output, but also the broader restructuring of economic activities through technological innovation and digital integration. Indicators under this dimension capture aspects such as business environment, employment opportunities, economic strength, and the adoption of new trade models. Particular attention is given to the growth of ICT-related sectors, the expansion of e-commerce, and the rise of innovation-driven industries — key engines that reinforce a city's ability to generate sustained, high-quality productivity gains.



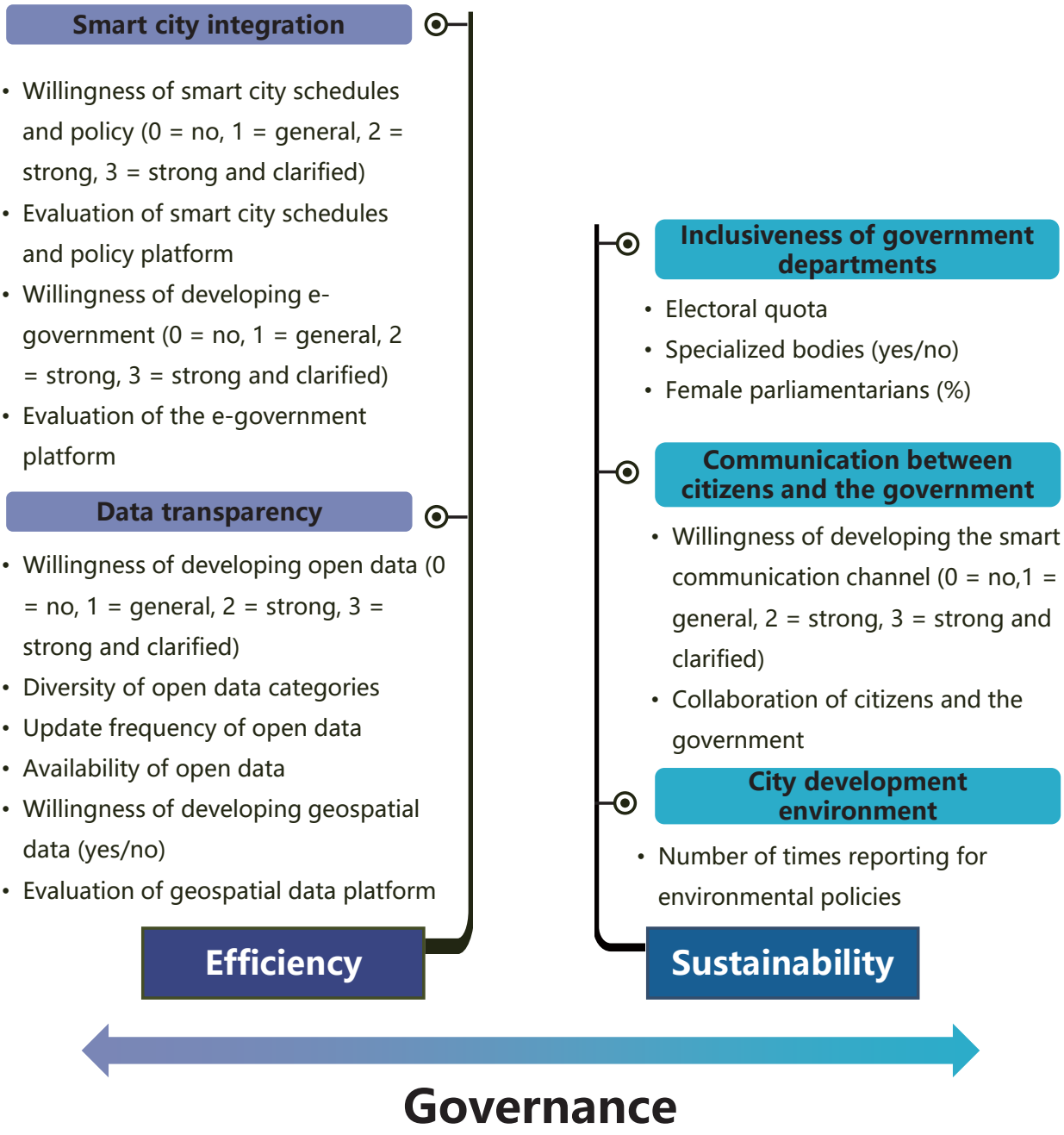
Infrastructure

Infrastructure centers on the development and integration of foundational urban systems that support daily life and long-term growth. As a key indicator of a city's development stage, infrastructure reflects its capacity to meet basic needs while enabling sustainable and connected urban living. This dimension evaluates the quality and accessibility of transportation systems, communication networks, environmental monitoring infrastructure, and public cultural facilities, all of which are essential for ensuring urban efficiency, resilience, and inclusiveness.



Governance

Governance highlights the effectiveness of interactions between government, citizens, and other stakeholders in shaping inclusive and responsive urban governance. This dimension evaluates how well government services align with public needs, the degree of transparency and openness in decision-making, and the inclusiveness of participatory processes. It also examines the feasibility and effectiveness of public-private partnerships, as well as the government's capacity to lead and coordinate sustainable development initiatives, particularly in environmental governance.



Methodology

Selection Criteria of Indicators

We aim to establish a new evaluation framework for smart cities that could extensively assess the development status of smart cities worldwide using objective data, in the selection of indicators that constitute the index, the following principles are adhered to.

Independent:
Indicators are independent of each other as far as possible. This ensures the acquisition of more comprehensive and diverse information for evaluating smart cities. It also helps avoid the overrepresentation of certain features of the cities, which is a source of bias.

Comprehensive:
There are 97 indicators covering six dimensions of smart cities: Citizen, Environment, Social landscape, Economy, Infrastructure, and Governance.

Universal:
The indicators should be applicable to cities in different cultures and at different stages of development. This could enable the usability of the evaluation framework across different cities and reduce the bias of the evaluation result against cities of certain stages of development, culture, or geographical regions. Additionally, the metric of an indicator should be consistent and unified across different regions.

Representative:
Indicators that are representative in this field should be selected to capture the essence of the objective being evaluated.

Quantifiable:
Indicators can be measured by using actual data, such as the number of facilities per resident, and other tangible measurements.

Available:
The data is available from public sources.

Objective:
The data is derived from an objective assessment, with an effort made to minimize subjective opinions from the individuals providing the data.

Interpretable:
The results are explained and analyzed. The ranking of cities can only reflect their relative developmental differences. Without appropriate explanations and interpretations, the significance of urban evaluation would be lost.

Keep updating:
The data for the selected indicators could be updated periodically. Continuous observation and assessment are beneficial for analyzing the implementation status of smart-city development strategies, the impact of specific events on cities, and the condition of urban renewal and recovery.

Data Sources

In this 2025 edition, the index is implemented on 73 worldwide cities entirely based on publicly available data, including official data, user-generated data, widely recognized third-party (e.g., international organizations) data, and official media data. In terms of geographical data, we conducted rigorous verification of official geographic platform data, user-generated data, and statistical data to ensure the rigor of the experiment. The data sources are listed as follows.

Data sources for ISUI Smart City index
Air Quality Open Data Platform
Bike-sharing World Map
Chargemap
City open geographic data platform
City Statistical yearbooks
Customer Data Platform
European Ombudsman
Green Building Information Gateway (GBIG)
IQAir
IPU Parline
Macrotrends
NUMBEO
NordicSmartCities
OECD Open Data
Official Government Announcements
OpenStreetMap
Open Government
PlugShare
Portulans Institute
QS World University Rankings
SmilarWeb
Socrata
Speendtest
Statistia
The Meddin Bike-sharing World Map
TomTom
Uber (Service offer official website)
UN Habitat statistics
United Nation Statistical Database (UNSD)
United Nations Sustainable Development Goals data
Wikipedia
World Bank's Data Bank
World Happiness Report based on the Gallup World Poll data

Calculation Method

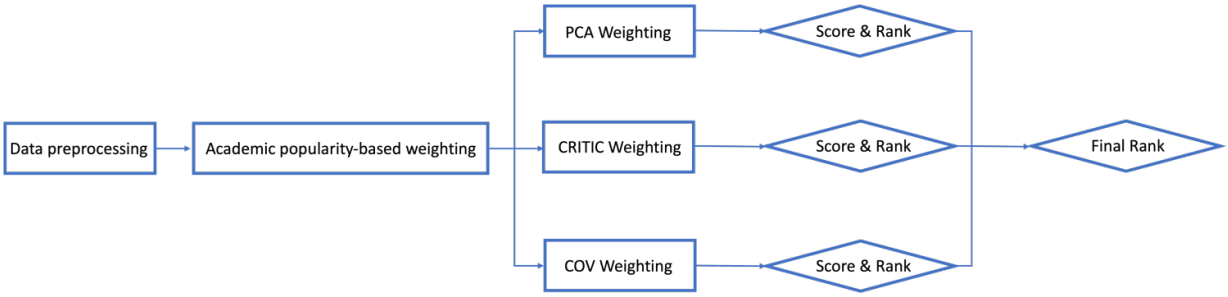


Fig. Flowchart of score and ranking calculations

1. Data preprocessing: The data values of different cities for each indicator of the index are normalized to ensure their homogeneity and compatibility. Also, we correct the inherent limitations of per capita indicators in this step, where simple ratios tend to overestimate values in small-population cities and underestimate them in large-population ones.

2. Subjective weighting: The subjective weighting process is used to determine the weights of each objective under a given dimension. We adopt an academic popularity-based weighting method, where the relative weight of each category is derived from the academic attention it receives. Specifically, we assess the number of academic publications related to each category and its associated indicators. A higher volume of relevant research indicates greater topical importance, and thus a higher assigned weight. Keywords used in the search include both the category name and the specific indicators it encompasses.

3. Objective weighting. The objective weighting process is used to determine the weights of each indicator under a given dimension. We implement robust statistical algorithms to enhance fairness under heavy-tailed data and geographical generalization. Using these techniques, we derive objective weights through three independent methods: Principal component analysis (PCA), Criteria importance through inter-criteria correlation (CRITIC), and Coefficient of variation method (COV). The general idea for these methods is that an indicator with more variations in data is given a higher weight.

4. Calculating scores and ranks. The scores and ranks of the cities in each smart-city dimension are calculated by combining the subjective weight of each category of indicators, the objective weights of the indicators under each category, and the normalized data for each indicator. The final rank of a city is based on average scores by using three objective weighting methods.

Ranking Results

Selection of 73 Cities

The index was empirically studied by selecting 73 representative cities worldwide, according to the following criteria.

Africa: 4
Asia: 25
Europe: 23
North America: 13
Oceania: 4
South America: 4

Economic groups:
Advanced Economies (AEs): 40
Emerging Market and Developing Economies (EMDEs): 33

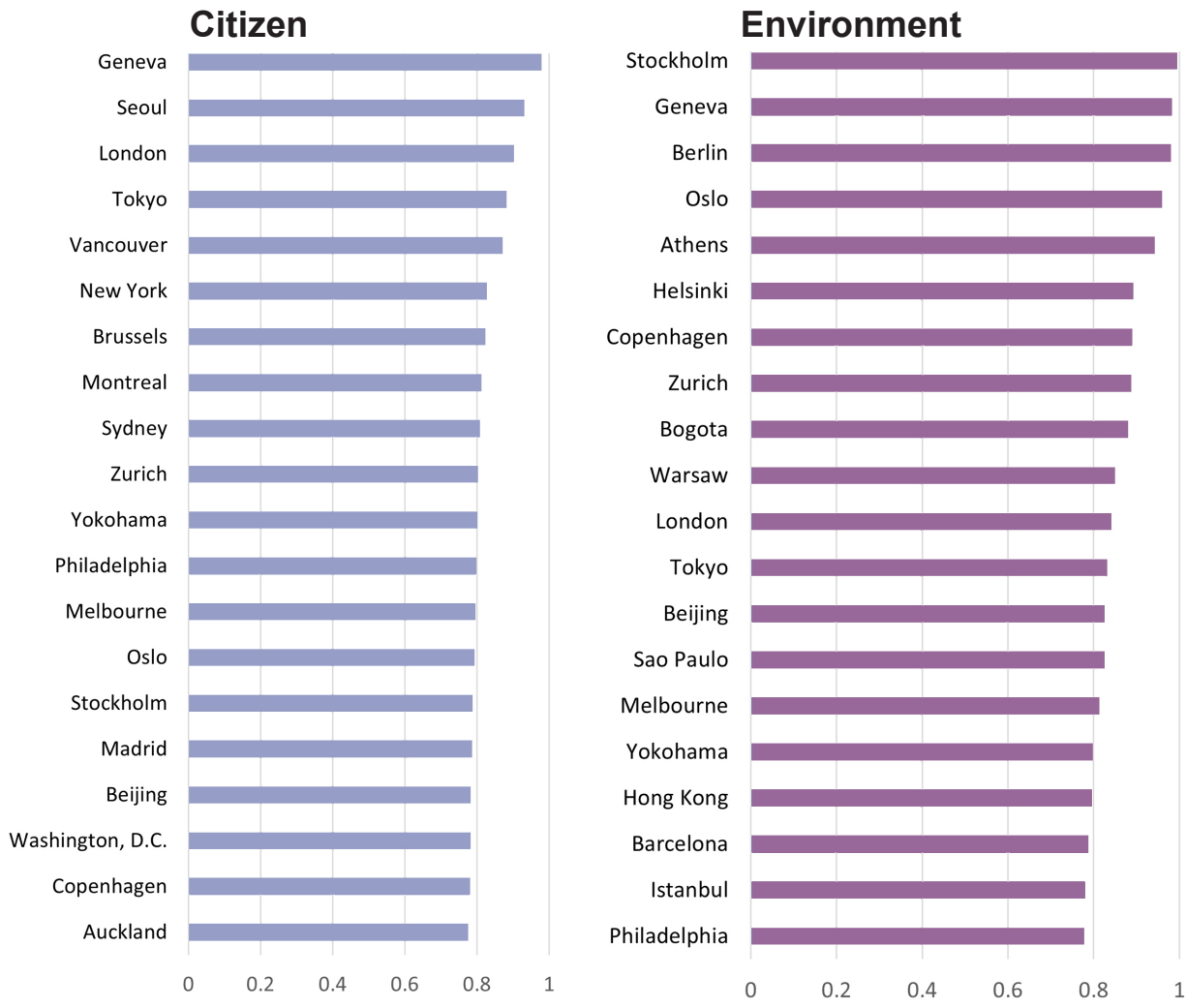
• Geographically, the selected cities cover most of the world and are representative in terms of nation/region;
• The selected cities have relatively high levels of data disclosure. For example, there are official government websites or departments that disclose data; and
• The selected cities cover economies of different degrees of development and cultures.

Overall Ranking of Cities 2025

City	Country	Overall Ranking
Stockholm	Sweden	1
Washington, D.C.	USA	2
Barcelona	Spain	3
London	UK	4
Tokyo	Japan	5
Zurich	Switzerland	6
New York	USA	7
Hong Kong	China	8
Copenhagen	Denmark	9
Oslo	Norway	9
Geneva	Switzerland	11
Helsinki	Finland	11
Seoul	South Korea	13
Auckland	New Zealand	14
Beijing	China	15
Philadelphia	USA	15
Berlin	Germany	17
Chicago	USA	18
Paris	France	19
Toronto	Canada	20
Singapore	Singapore	21
Munich	Germany	22
Sydney	Australia	22
Wellington	New Zealand	22
Shenzhen	China	25
Los Angeles	USA	26
Milan	Italy	27
Melbourne	Australia	28
Yokohama	Japan	28
Vancouver	Canada	30
Manchester	UK	31
Seattle	USA	32
Madrid	Spain	33
Athens	Greece	34
Abu Dhabi	UAE	35
Guangzhou	China	36
Vienna	Austria	37
Warsaw	Poland	38
Shanghai	China	39
Miami	USA	40
Busan	South Korea	41

Dubai	UAE	42
Brussels	Belgium	43
Montreal	Canada	44
Bogota	Colombia	45
Kuala Lumpur	Malaysia	46
Hangzhou	China	47
St. Petersburg	Russia	47
Buenos Aires	Argentina	49
Incheon	South Korea	50
Lisbon	Portugal	51
Rio de Janeiro	Brazil	52
Osaka	Japan	53
Riyadh	Saudi Arabia	53
Bangkok	Thailand	55
Rome	Italy	56
Sao Paulo	Brazil	57
Istanbul	Turkey	58
Moscow	Russia	58
Jakarta	Indonesia	60
Delhi	India	61
Muscat	Oman	62
Manila	Philippines	63
Mumbai	India	64
Guadalajara	Mexico	65
Cape Town	South Africa	66
Karachi	Pakistan	67
Mexico City	Mexico	68
Monterrey	Mexico	69
Johannesburg	South Africa	70
Cairo	Egypt	71
Dhaka	Bangladesh	72
Lagos	Nigeria	73

Dimension Rank Result - Top 20 Cities



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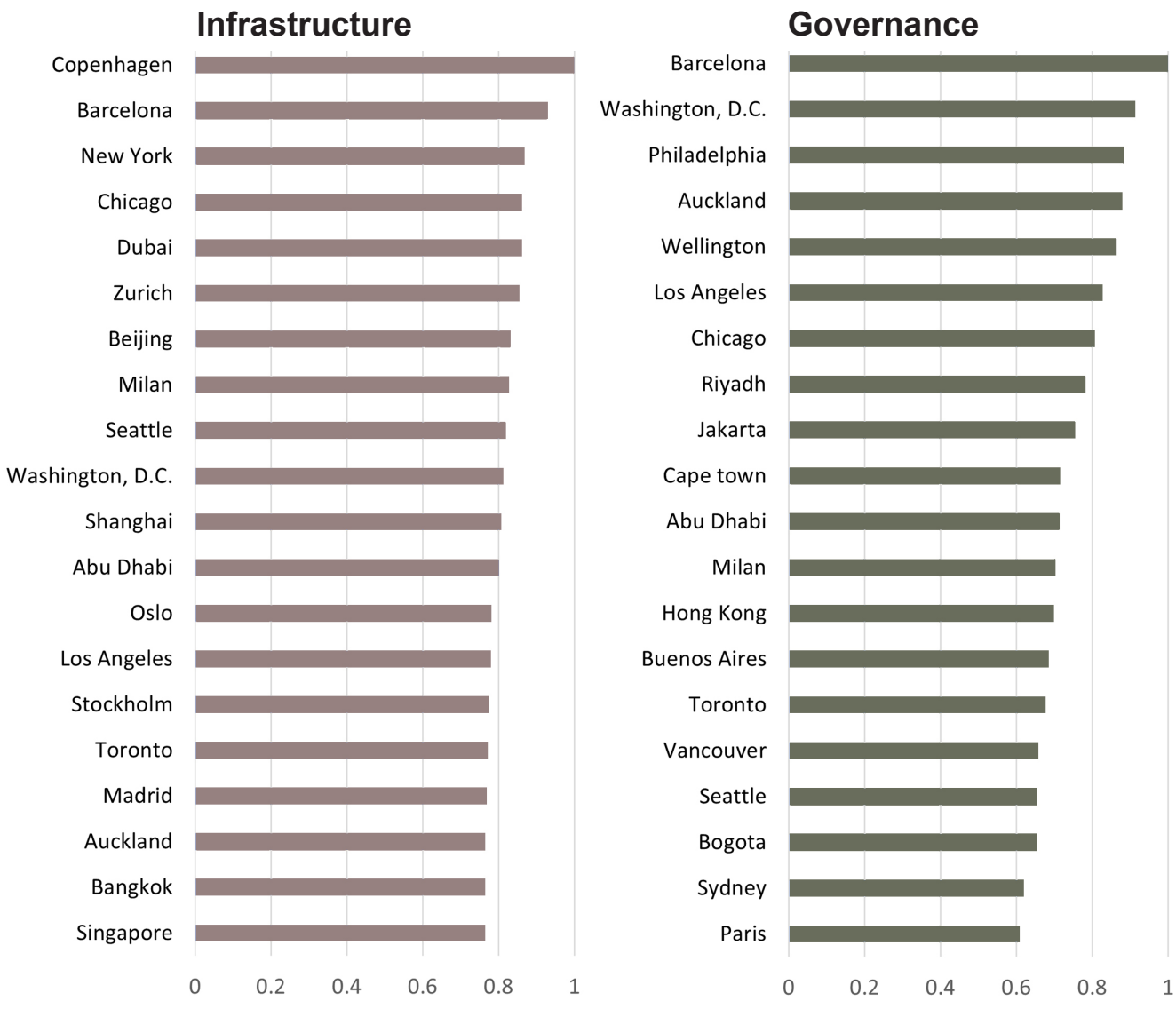

Discussion

This white paper presents a human-centric framework for evaluating smart cities, with a primary focus on the quality of life of urban residents and the ways in which technology can enhance everyday well-being. Our goal is not to assess technological advancement per se, but rather to understand how urban systems — when supported by appropriate technological or policy tools — can better serve the people who live in them. Accordingly, a higher ranking in our index does not necessarily imply that a city is more technologically advanced or digitally transformed. Instead, it reflects stronger performance in terms of inclusive, efficient, and sustainable urban living.

In the selection of indicators, we have emphasized global applicability and data openness. While we acknowledge that some cities or dimensions may offer more refined or locally tailored indicators, our priority has been to ensure cross-city comparability and maximize data coverage across the sample. In this context, we often chose indicators that, while perhaps not the most granular, offered the best trade-off between relevance and availability across a broad international set of cities.

With regard to data sources, our first preference has always been to use officially disclosed statistics. However, for several key indicators, such data is unavailable in many cities. In such cases, we turned to third-party institutions and publicly accessible online resources. We are aware that these sources may carry regional biases due to differences in data collection methods or platform availability. To mitigate such risks, we employed a cross-referencing strategy across multiple sources and selected the data with the smallest observed deviations, aiming to reduce the potential distortions introduced by inconsistent data quality.

We recognize that all data-driven assessments involve trade-offs, and we remain open to improving both our framework and data input in future iterations of this work.

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