

AFRICAN SMART CITY **INDEX 2024**





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About the Authors

The Africa Smart City Index 2024 was developed by a multidisciplinary team of experts specializing in Technology Management, Economics, Policy, and a range of advanced fields including Smart City Global Convergence, Data Sciences, and Artificial Intelligence. The research team spent a total of 10 months preparing the report, during which they developed a robust framework and methodology for assessing African cities. A substantial amount of data was collected and analyzed to ensure a comprehensive evaluation of African cities. The authors are deeply grateful to all those who contributed to the project, particularly the city experts and African city officials who participated in the surveys, providing valuable insights that greatly enhanced the accuracy and depth of the findings.



Author 1: Dr. Rene Kabalisa

Dr. Kabalisa earned his Ph.D. from Seoul National University (South Korea) in the Technology Management, Economics, and Policy with an Integrated Major in Smart City Global Convergence, as well as a master's degree in information systems with a major in ICT4D and Innovation from Kobe Institute of Computing, Graduate School of Information Technology (KIC), Kobe, Japan.

His research interests include Technology Innovation, Innovation Policies, Startups Ecosystem Development, Innovation Management, Technology Forecasting, Patent Development, Adoption of Emerging Technologies (AI, Drones, Smart cities, ..).

Author 2: Dr. Yodit Gebrealif

Dr. Yodit Gebrealif is an Assistant Professor in the Department of Software Engineering and a researcher at the Big Data & HPC Center of Excellence at Addis Ababa Science and Technology University, Ethiopia. She earned her Ph.D. from Seoul National University (South Korea) in the Technology Management, Economics, and Policy Program Integrated Major with Smart City Global Convergence and a master's degree in software engineering.

She has contributed her expertise in digital transformation and advancing smart city initiatives, including her work on the Shaggar Smart City project in Ethiopia, where she is part of the core team developing the strategic plan. Her expertise lies in citizen-centric

smart city frameworks. She has shared her research findings in this topic, as well as various research related to digital transformation and cloud federation adoption standards, at numerous conferences, including the 12th International Conference on Appropriate Technology 2021 (Smart Science and Technology ODA with Corona), GECON, and the ESAK workshop, where she has also served as a co-reviewer and organizer. Her research interests encompass a wide range of topics, including digital transformation, knowledge management in digital transformation, digital health, cloud federation, container orchestration, cloud security, and the role of trust and institutional quality in cloud federation formation.



Author 3: Dr. Sebakara Samuel Rene Adolphe



Dr. Sebakara Samuel Rene Adolphe earned both his Ph.D. and Master's degree of Engineering in Computer Science and Technology from the University of Electronic Science and Technology of China (UESTC). As a senior researcher with the Mobile Cloud-Net Research Team at UESTC, his research focuses on AI, 5G communication, SDN, NFV, IoT, UAV technologies, and robotics. He has authored over seven SCI-ranked publications, contributing to innovative advancements in computer networks and emerging technologies.

In addition to his academic contributions, Dr. Sebakara is the Founder of Vanguard's Technology Labs (VTLABs Group), driving innovation through research, practical training, and manufacturing. With over a decade of experience in academia and technology leadership, he is dedicated to mentoring youth and collaborating with stakeholders to foster skills development and advance global technological innovation.

Author 4: Miss. Florence Kwamboka Moseti

Miss Florence Moseti is a Computer Engineer and is currently affiliated with the Ministry of Interior and Coordination of National Government, Kenya. Prior to that she took part in the implementation of the E-Revenue System (Jambo Pay) for Nairobi County Government, whereby she successfully led the adoption of a technology-driven system as In-charge Langata Sub-county resulting in streamlined, efficient, reduced errors, more convenient/accessible, and enhanced customer satisfaction. The project became an essential asset to the Government of Kenya for enhancing digital transformation. Miss Moseti earned her M.Sc. in Engineering with an integrated Major in Smart City Global Convergence from Seoul National University, South Korea as well as a Bachelor of Science in Information and Communication Technology from Jomo Kenyatta University (JKUAT), Kenya. Her research interests involve Technology Convergence, Emerging Technologies, Technology management and policies, Digital Innovation and Transformation, bridging Digital Divides, and Sustainable Development.



Executive Summary

The **Africa Smart City Index 2024**, now in its second edition, evaluates the progress of 36 cities across five critical dimensions: **Smart Governance and Strategy, Smart Mobility and Access, Smart Economy and Innovation, Smart Environment and Integration, and Smart Living and Wellbeing**. The index provides a detailed assessment of how cities are integrating technology, fostering innovation, and promoting sustainability, offering policymakers and investors actionable insights into best practices and opportunities for growth.

This year's expanded scope from 30 to 36 cities captures a more diverse range of urban contexts and showcases how African cities are addressing challenges through citizen-focused governance, improved transportation systems, digital economic growth, environmental stewardship, and enhanced quality of life.

The Africa Smart City Index 2024 rankings are based on 46 indicators across five categories: **Smart Governance** (7 indicators), **Smart Mobility** (8 indicators), **Smart Economy** (14 indicators), **Smart Environment** (7 indicators), and **Smart Living** (10 indicators). These indicators are sourced from secondary data and supplemented by survey data, capturing the impact of smart city initiatives from the residents' perspective. This combination of data sources ensures a comprehensive assessment of urban development and quality of life within smart cities across Africa.

Johannesburg has claimed the top position overall, reflecting its leadership in governance, economic innovation, and sustainability. The city's ability to integrate technology and data to enhance service delivery, create economic opportunities, and improve urban living has set a benchmark for the continent. Joining Johannesburg in the top five are **Nairobi, Kigali, Lagos, and Kampala**, each representing unique strengths and progress. Nairobi and Kigali maintain strong performances due to their focus on innovation ecosystems and sustainable urban mobility. Lagos has made significant strides by leveraging its dynamic economy and large population to advance smart governance and mobility. Kampala emerges as a rising star, achieving notable progress in digital adoption and environmental initiatives, signaling its growing potential as an urban innovator.

The 2024 index highlights key trends, including the importance of policy-driven growth, innovative transport solutions, resilient economies, and inclusive living standards. By focusing on leaders like Johannesburg, innovators like Kampala, and hubs like Lagos, the index underlines the transformative potential of smart strategies and regional collaboration. It provides a roadmap for cities to adopt scalable, adaptable solutions that address their unique challenges while paving the way for sustainable and inclusive urban futures.

Overall ASCIS2024 Ranking	
1	Johannesburg
2	Nairobi
3	Kigali
4	Lagos
5	Kampala

Smart Living and Wellbeing	
1	Johannesburg
2	Kampala
3	Abidjan
4	Nairobi
5	Kigali

Smart Environment and Integration	
1	Accra
2	Nairobi
3	Libreville
4	Kigali
5	Harare

Smart Economy and Innovation	
1	Johannesburg
2	Lagos
3	Cairo
4	Nairobi
5	Port Louis

Smart Mobility and Access	
1	Kigali
2	Accra
3	Addis Ababa
4	Kampala
5	Nairobi

Smart Governance and Strategy	
1	Johannesburg
2	Tunis
3	Kigali
4	Abidjan
5	Dakar

1. SMART CITIES IN AN AFRICAN CONTEXT

The concept of smart cities has traditionally been associated with developed nations, where cutting-edge technologies such as electric vehicles, AI-powered robots, and advanced urban systems have been showcased at global events like the Smart City Expo 2022. While some of these innovations may not yet be fully applicable to African cities due to limited digital infrastructure, the core principles of smart cities—enhancing urban living through technology, data-driven governance, and sustainable practices—are increasingly relevant to the continent. Africa's rapid urbanization and unique challenges present an opportunity to adapt and apply smart city solutions tailored to its specific needs.

Urban migration in Africa continues to accelerate as people seek better living standards, economic opportunities, and security. This trend, exacerbated by the economic aftermath of the COVID-19 pandemic, has placed immense pressure on cities to expand their infrastructure and improve public services. Currently, Africa is home to three megacities—Cairo, Kinshasa, and Lagos—which collectively house over 35 million people. By 2050, four additional mega-cities—Dar es Salaam, Nairobi, Khartoum, and Luanda—are expected to emerge. Smart city technologies offer a solution to manage this growth effectively by enabling cities to optimize resources, improve service delivery, and enhance urban planning.

One of Africa's key advantages in adopting smart city solutions lies in its flexibility to develop new systems without being constrained by legacy infrastructure. This adaptability allows African cities to leapfrog outdated approaches and implement innovative technologies to boost resource efficiency and public service delivery. Additionally, smart cities create a fertile ground for attracting foreign direct investment (FDI), which is vital for funding urban development. Kenya's emergence as the "Savannah Valley," a leading tech hub, exemplifies how embracing innovation can enhance economic growth and global competitiveness.

Kigali exemplifies smart city innovation in Africa by attracting prestigious institutions like **Carnegie Mellon University** and **African Leadership University**, alongside incubators such as **Norrskan House** and **Westerwelle Startup Haus**, fostering education, entrepreneurship, and innovation. These initiatives, combined with smart technologies improving urban services, position Kigali as a regional hub for talent, startups, and foreign investment, setting a benchmark for sustainable urban development in Africa.

Moreover, the transition to smart cities offers a pathway for African countries to diversify their economies. Many nations have long depended on natural resources, leaving them vulnerable to price fluctuations. By investing in the digital economy—which is projected to contribute 5.2% to Africa's GDP by 2025—cities can foster entrepreneurship, create jobs, and reduce economic dependency on raw materials.

Smart cities in Africa represent more than just technological advancement; they embody a vision of sustainable, inclusive, and efficient urban living. By harnessing innovation, embracing collaboration, and addressing local challenges with tailored solutions, African cities are poised to redefine urbanization and provide a better quality of life for their rapidly growing populations.



2. PROPOSED MODEL

The index has employed a robust methodology that integrates quantitative data analysis with qualitative assessments. A diverse set of indicators has been selected to capture the complexity of urban environments, with data sourced from various reliable channels to ensure a thorough evaluation.

2.1. Conceptual Framework

2.1.1. Definition of Smart Cities

Smart cities are urban areas that leverage technology and data to enhance the quality of life for residents, improve sustainability, and optimize urban services and infrastructure. By integrating information and communication technologies (ICT) into city management, smart cities aim to create efficient, responsive, and inclusive environments that address contemporary urban challenges

2.1.2. Dimensions of Smartness

The dimensions of smartness in smart cities typically include governance, mobility, environment, economy, and quality of life. These dimensions collectively assess how effectively a city utilizes technology and data to improve urban living, enhance sustainability, and foster economic growth while ensuring citizen engagement and well-being. Inline with smart city indexing, the dimensions of smartness typically include:

Smart Governance and Strategy: Evaluates the effectiveness of local government, transparency, and citizen participation in decision-making.

Smart Mobility and Access: Assesses the efficiency and accessibility of transportation systems, including public transport and alternative mobility options.

Smart Environment and Integration: Focuses on sustainability practices, such as waste management, air quality, and green spaces.

Smart Economy and Innovation: Analyzes economic opportunities, job creation, and support for local businesses, emphasizing innovation.

Smart Living and Wellbeing: Measures overall resident well-being, including access to healthcare, education, and cultural activities.

2.2. Indicators

2.2.1. Selection of Indicators

Apart from indexing dimensions which are broad categories or areas of assessment that encompass multiple related indicators, we consider indexing Indicators that are specific, measurable variables that provide data points within each dimension. They are the actual metrics used to assess performance in a particular area and subdivided into quantitative and Qualitative indicators.

Quantitative Indicators: These are numerical measures that quantify variables, making them objective and comparable. They are based on data that can be counted or measured, such as percentages, rates, and statistical figures. Quantitative indicators are useful for tracking trends, comparing performance, and assessing measurable outcomes.

Qualitative Indicators: These are non-numerical measures that describe qualities, characteristics, or perceptions. They are often based on subjective assessments, such as expert opinions, interviews, surveys, or case studies. Qualitative indicators provide insights into processes, behaviors, and attitudes, helping to capture the context and depth of a phenomenon.

LIST OF DIMENSIONS AND INDICATORS FOR ASCIS 2024

Smart City Dimensions	Categories	Indicators	Type	Normalization
Smart Governance and Strategy	Presence of smart city policy and plan	Availability of published smart city policy/plan	Qualitative	Yes No
		Availability of a dedicated team to execute the plan	Qualitative	Yes No
		Availability of published and actionable budget	Qualitative	Yes No
	Access to Municipality Service and data strategy	Effectiveness of E-Government Development	Quantitative	Scored by EGDI Analyst
		Presence of an e-government strategy or equivalent	Qualitative	Yes No
	digital infrastructure	ICT investments as % of GDP	Quantitative	Feature Scaling
		Digital ID service availability	Qualitative	Yes No
Smart Mobility and Access	Mobility Policy and Governance	EV Incentives	Qualitative	Yes No
		Walking and Cycling Policy	Qualitative	Yes No
		Design standards for pedestrians /cyclists	Qualitative	Yes No
	Traffic and Environmental factors	Polluted Cities	Quantitative	min-max
		CO2 from transport	Quantitative	min-max
	Mobility Infrastructure and Accessibility	Preparedness to adopt EVs at scale	Qualitative	Scored by AEVR II Analyst
		Broader benefits of EV adoption	Qualitative	Scored by AEVR II Analyst
		Accessibility to Public Transport within at least 500 meters	Quantitative	Feature Scaling
	Smart Economy and Innovation	Infrastructure Economy	% of households with access to broadband	Quantitative
ICT Development			Qualitative	Scored By IDI Analyst
	Innovation and Technology	Innovation Institution	Quantitative	Min-Max
		Human capital and research	Quantitative	Min-Max
		Innovation Infrastructure	Quantitative	Min-Max
		Knowledge and Technology Output	Qualitative	Min-Max
		Creative Outputs	Qualitative	Min-Max
		Startup status compared in the globe	Qualitative	Min-Max

	Business and Market Dynamics	Market Sophistication	Qualitative	Scored By WGII Analyst
		Business Sophistication	Qualitative	Scored By WGII Analyst
		Ease of Doing Business	Qualitative	Feature Scaling
		Number of fintech startups	Quantitative	Min-Max
		Number of tech startups funded in 2023	Quantitative	Min-Max
	Green Economy and Sustainability	Circular Economy Initiatives	Qualitative	Yes No
Smart Environment and Integration	Renewable and Clean Energy Access	Urban electric access rate %	Quantitative	Feature Scaling
		Renewable Energy share in Total Final Energy Consumption (%)	Quantitative	Feature Scaling
		Clean Energy Access	Qualitative	Scored By WGII Analyst
		E-waste generated (million kg)	Quantitative	Min-Max
		E-waste generated (kg/capital)	Quantitative	Min-Max
		National E-waste legislation / policy or regulation in place	Qualitative	Score by EUI
		Recycling targets in place	Qualitative	Score by EUI
Smart Living and Well-Being	Living Standards and Accessibility	Affordable Data Index	Qualitative	Feature Scaling
		Living standards contributed to overall poverty %	Qualitative	Feature Scaling
	WellbeingSmart and education	Health Care Center with electric access	Qualitative	Feature Scaling
		Health Contribution to Global Poverty Index%	Qualitative	Feature Scaling
		Education Contribution to Global Poverty Index%	Qualitative	Feature Scaling
	Digital Societal Safety	Legal Measures	Qualitative	zero-max
		Technical Measures	Qualitative	zero-max
		Organizational Measures	Qualitative	zero-max
		Capacity Development	Qualitative	zero-max
		Cooperation Measures	Qualitative	zero-max

2.3. Normalization and Weighting

To ensure that all indicators are on a comparable scale, we normalize each indicator using min-max normalization. And we assign a weight to each dimension to capture its importance in the indexing processes.

2.3.1. Quantitative data Indexing Score formulation

Let $D = \{1, 2, 3, d\}$ denote the set of dimensions, where each dimension has a set of indicators represented by $I_d = \{1, 2, 3, i\}$. Each dimension d has a weight ω_d , and for each indicator i , will have its normalized value N_i using min-max normalization as follow:

$$\varphi_i = (i - i_{min}) \div (i_{max} - i_{min}) \quad (1)$$

Where i_{max} , i_{min} denote maximum value and minimum value of index i respectively. The overall quantitative index score ζ_{qnt} can be calculated using the following formula:

$$\zeta_{qnt} = \sum_{d=1}^{|D|} \omega_d \cdot \sum_{i=1}^{|I_d|} (\varphi_i) \quad (2)$$

2.3.3. Qualitative data Indexing Score formulation

Define Variables

Let $T_d = \{1, 2, 3, \dots, t\}$ be the set of key themes (Qualitative indicators of a given dimension d) from Qualitative data (e.g., Safety Perception, Police Effectiveness). We define $s = \langle s_t^p, s_t^n, s_t^m \rangle$ as a tuple of sentiment scores for each theme t based on participant responses, where $s_t^p = 1$, $s_t^n = 0$, $s_t^m = -1$ represent positive sentiment, neutral sentiment, and negative sentiment respectively. And let α_t^p , α_t^n , α_t^m , denote the total number of positive, neutral and negative responses for each theme respectively. Given that we also assign weights ω_t^p , ω_t^n , ω_t^m respectively to each theme based on its perceived importance or relevance to the overall objective, the weighted sentiment score ϖ_t for a given theme t can be calculated as follow,

$$\varpi_t = \left[(\alpha_t^p \cdot \omega_t^p) + (\alpha_t^n \cdot \omega_t^n) + (\alpha_t^m \cdot \omega_t^m) \right] \div \chi_t \quad (3)$$

Where χ_t is the total number of responses on the theme t .

Given the weighted sentiment score for each theme, we can aggregate composite index score λ_d also known as dimension index score for Qualitative data as follow,

$$\lambda_d = \sum_{t=1}^{|T_d|} \varpi_t \quad (4)$$

To ensure the index score is on a standardized scale (e.g., 0 to 1), we normalize the composite index score λ_d as follow,

$$N\lambda_d = \left(\lambda_d - \lambda_d^{min} \right) \div \left(\lambda_d^{max} - \lambda_d^{min} \right) \quad (5)$$

2.4. Index Calculation

Aggregation Method

The overall Index Δ will be obtained by aggregating both the normalized Qualitative index and the Quantitative index as follow,

$$\Delta = \sum_{d=1}^{|D|} N\lambda_d + \zeta_{qnt} \quad (6)$$

2.4.1. Key Considerations

Weighting and Sensitivity Analysis

Weighting factors for each dimension are determined through consultation with urban planning experts and stakeholders, and sensitivity analysis is applied to understand the impact of these weights on the final index score.

Data Integrity and Validation

Data for quantitative indicators are sourced from reliable databases, and Qualitative assessments are validated using representative survey samples to ensure accuracy and generalizability.

Index Interpretation

A higher score indicates a city that effectively integrates technology and policy to improve urban life and sustainability, while a lower score highlights areas needing attention and improvement.

3. CITY RANKING CATEGORIES

To ensure that all indicators are on a comparable scale, we normalize each indicator using min-max normalization. And we assign a weight to each dimension to capture its importance in the indexing processes.

CITY	SMART GOVERNANCE AND STRATEGY	SMART MOBILITY AND ACCESS	SMART ECONOMY AND INNOVATION	SMART ENVIRONMENT AND INTEGRATION	SMART LIVING AND WELL BEING	OVERALL RANK
ABIDJAN	4	22	15	10	3	7
ACCRA	19	2	12	1	7	6
ADDIS ABABA	17	3	19	21	21	13
ALGIERS	9	28	9	36	33	27
ANTANANARIVO	25	8	23	25	34	26
BAMAKO	24	24	32	22	19	29
CAIRO	15	6	3	31	14	11
CONAKRY	22	36	33	26	29	35
DAKAR	5	27	10	14	9	9
DAR ES SALAAM	12	23	21	9	12	15
FREETOWN	26	35	29	29	26	33
GABORONE	33	18	7	12	31	19
HARARE	16	14	18	5	22	14
JOHANNESBURG	1	7	1	13	1	1
JUBA	36	34	34	32	36	36
KAMPALA	7	4	20	8	2	5
KHARTOUM	32	31	34	15	35	34
KIGALI	3	1	16	4	5	3
KINSHASA	28	19	30	28	24	28
LAGOS	6	12	2	16	6	4
LIBREVILLE	34	32	11	3	27	25
LILONGWE	13	13	31	24	17	17
LOME	23	20	17	17	16	18
LUANDA	21	16	22	18	30	21
LUSAKA	11	10	14	7	10	8
MAPUTO	18	25	24	23	15	23
N'DJAMENA	31	30	27	30	32	31
NAIROBI	10	5	4	2	4	2
NIAMEY	30	26	36	27	23	32
NOUAKCHOTT	35	33	25	20	28	30
OUAGADOUGOU	27	21	28	19	8	20
PORT LOUIS	14	15	5	35	25	22
RABAT	8	9	6	33	13	10
TUNIS	2	11	8	34	20	12
WINDHOEK	20	17	13	11	11	16
YAOUNDE	29	29	26	6	18	24

3.1. Smart Governance and Strategy

Implementing Technologies in government services will undoubtedly increase the services' efficiency. Smart governance enhances decision-making processes, fosters transparency, and promotes citizen engagement. By leveraging technology, governments can create more resilient and adaptive urban environments. These improvements have a ripple effect, positively impacting other pillars such as smart infrastructure, economy, and quality of life.

The African Smart City Index 2024 assesses and ranks 36 African cities based on their smart governance and strategy efforts. This pillar evaluates the presence and effectiveness of policies, plans, and infrastructure necessary for smart city development. Seven indicators across three categories were utilized to assess this pillar. Key indicators include the availability of published smart city policies, dedicated teams to execute these plans, and actionable budgets. Additionally, it examines access to municipal services and data strategies through the E-Government Development Index (EGDI) and the presence of e-government strategies. Digital infrastructure is also assessed, focusing on ICT investments as a percentage of GDP and the availability of digital ID services. Furthermore, a questionnaire was disseminated to evaluate the impact of smart governance and its strategy initiatives on the residents.

Top 5 ranked cities in smart governance and strategy pillar

Johannesburg

Tunis

Kigali

Abidjan

Dakar



Johannesburg, ranked number one, has implemented a comprehensive smart governance strategy aimed at enhancing service delivery and reducing inequalities. The key initiatives include the Joburg Smart City Strategy, rolling out broadband and Wi-Fi in public spaces, and fostering innovation through community challenges (reference Smart City Community Innovation Challenge and Awards). These efforts have significantly improved connectivity, streamlined administrative processes, and promoted socioeconomic development.



Tunis, ranked number two, has focused on creating transparent, citizen-oriented governance through digital municipalities. For instance, the city has introduced the **Initiative for Municipal Development** in Tunisia, supported by the German Federal Ministry for Economic Cooperation and Development (reference **Digital municipalities in Tunisia: transparent, citizen-oriented and efficient - giz.de**). This initiative has enhanced transparency, efficiency, and citizen engagement, leading to better municipal services and increased trust between citizens and local authorities.

Kigali has been ranked number three in smart governance, highlighting its extensive access to e-services and dedication to efficient, citizen-centric administration. The city's online services, such as job search portals, utility payments, business registration, and public health information, have received high satisfaction levels from residents. This ranking reflects Kigali's commitment to leveraging technology to improve public services and enhance the overall quality of life for its citizens.

CITY	ASCIS 2024 Score for SMART GOVERNANCE AND STRATEGY	Rank
JOHANNESBURG	1.000	1
TUNIS	0.971	2
KIGALI	0.952	3
ABIDJAN	0.948	4
DAKAR	0.941	5
LAGOS	0.935	6
KAMPALA	0.929	7
RABAT	0.799	8
ALGIERS	0.784	9
NAIROBI	0.620	10
LUSAKA	0.604	11
DAR-ES-SALAAM	0.586	12
LILONGWE	0.576	13
PORT LOUIS	0.469	14
CAIRO	0.455	15
HARARE	0.418	16
ADDIS ABABA	0.394	17
MAPUTO	0.390	18
ACCRA	0.278	19
WINDHOEK	0.273	20
LUANDA	0.241	21
CONAKRY	0.239	22
LOME	0.237	23
BAMAKO	0.235	24
ANTANANARIVO	0.226	25
FREETOWN	0.222	26
OUAGADOUGOU	0.220	27
KINSHASA	0.217	28
YAOUNDE	0.211	29
NIAMEY	0.207	30
N'DJAMENA	0.201	31
KHARTOUM	0.171	32
GABORONE	0.104	33
LIBREVILLE	0.098	34
NOUAKCHOTT	0.060	35
JUBA	0.000	36



Governance & Strategy Highlights

Johannesburg

Strength: Joburg Smart City Strategy, Joburg e-services

Opportunity: Resource management issues: Waste and water concerns. Traffic congestion remains: Affects mobility and productivity.



Tunis

Strength: Access to e-service

Opportunity: Traffic congestion issues: Affects daily commutes. Digital divide exists: Unequal access to technology.

Resident's Perceptions: residents predominantly utilize e-government services to access public health information, environmental data, and local government services.



Kigali

Strength: Access to e-government

Opportunity: City level Smart city strategy

Resident's Perceptions: online services, including job search portals, utility payments, business registration, police reporting, and public health information, are highly regarded by the residence, with satisfaction levels rated as excellent to very good.



Adibjan

Strength: Smart city plan, Open data

Opportunity: Public Transport

Resident's Perceptions: Improving Infrastructure: Citizens appreciate ongoing development, Optimism about the city's future.

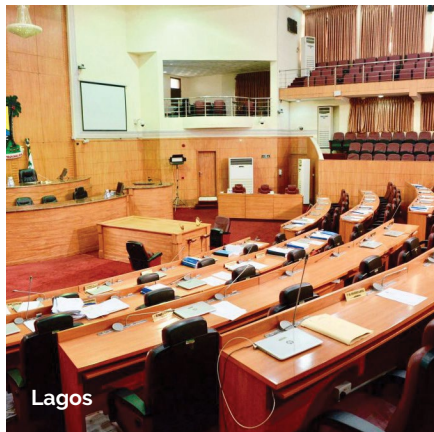


Dakar

Strength:

Opportunity: Community engagement, Heavy urban traffic delays, Growing urban waste volume.

Resident's Perceptions: Residents frequently utilize smart governance services for efficient and streamlined business registration processes; Frequent power outages occur.



Lagos

Lagos

Strength: 2030 Lagos Smart City Vision, Emerging startup ecosystem, Port City: Key trade and commerce hub

Opportunity: e-government, Long commute times daily, Poor drainage systems affect neighborhoods

Resident's Perceptions: The service is integral to residents's daily lives to access essential services such as public health information, utility payments, job search portals, and business-related information.

3.2. Smart Mobility and Access

As urban populations continue to grow, the pressure on roads and public transportation systems has increased. It's crucial to enhance the capacity and efficiency of these systems, as they are vital to city life. The index examines how technology implementation improves this efficiency through real-time travel data and public transport accessibility. Smart mobility technology offers numerous benefits to African cities, such as better traffic management, enhanced public transportation systems, and increased connectivity. Advanced traffic management systems, using real-time traffic monitoring, data analytics, and intelligent signaling, help optimize traffic flow, reduce congestion, and minimize travel time. Smart technologies in public transportation provide affordable and reliable options, decreasing reliance on private vehicles, and reducing traffic congestion and emissions. Additionally, smart mobility solutions improve connectivity by integrating various transportation modes—like buses, taxis, and trains—through unified platforms and mobile applications, making trip planning easier for citizens.

The African Smart City Index 2024 evaluates and ranks 36 African cities based on their smart mobility and access efforts across three categories: Mobility Policy and Governance, Traffic and Environmental Factors, and Mobility Infrastructure and Accessibility. Eight key indicators were utilized to assess this pillar. These include the presence of EV (Electric Vehicle) incentives, walking and cycling policies, design standards for pedestrians and cyclists, pollution levels in cities, CO2 emissions from transport, preparedness to adopt EVs at scale, broader benefits of EV adoption, and accessibility to public transport within at least 500 meters. The goal is to create more resilient, accessible, and eco-friendly urban transportation systems that can adapt to the growing needs of urban populations.

Top 5 ranked cities in smart mobility and access pillar

Kigali

Accra

Addis Ababa

Kampala

Nairobi



Kigali ranked first in smart mobility and access and has greatly improved public transport through the Public Transport Policy and Strategy and the Ministry of Infrastructure. The National Transport Policy and Strategy for Rwanda, adopted in April 2021, ensures the expansion and maintenance of the national road network, connecting different areas efficiently. These efforts reduce travel time, ease congestion, and promote sustainable economic growth.

Accra ranked second in the Smart Mobility and Access pillar, has made significant strides in improving urban mobility. The city's Bus Rapid Transit (BRT) system has greatly enhanced public transport and reduced traffic congestion. Additionally, the Pedestrian Road Safety Action Plan for the Accra Metropolitan Assembly aims to reduce pedestrian fatalities and improve road safety by enhancing crosswalks, managing public street spaces, and ensuring safe speeds near schools. These initiatives contribute to a more efficient, environmentally friendly, and accessible urban transport network, significantly enhancing the quality of life for Accra's residents.

Addis Ababa ranked third in the Smart Mobility and Access pillar and has made significant strides in improving urban mobility. The city's Corridor Development Project focuses on enhancing sidewalks, improving public transport, and reducing traffic congestion. This initiative aims to create better pedestrian and cycling routes, upgrade infrastructure, and promote sustainable urban transport, making Addis Ababa more accessible and efficient for its residents.



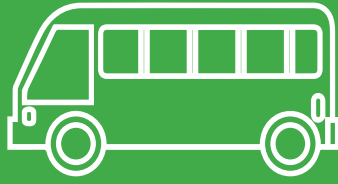
CITY	ASCIS 2024 Score in SMART MOBILITY AND ACCESS	Rank
KIGALI	1.000	1
ACCRA	0.980	2
ADDIS ABABA	0.972	3
KAMPALA	0.964	4
NAIROBI	0.949	5
CAIRO	0.911	6
JOHANNESBURG	0.826	7
ANTANANARIVO	0.808	8
RABAT	0.801	9
LUSAKA	0.733	10
TUNIS	0.707	11
LAGOS	0.684	12
LILONGWE	0.634	13
HARARE	0.621	14
PORT LOUIS	0.589	15
LUANDA	0.540	16
WINDHOEK	0.465	17
GABORONE	0.455	18
KINSHASA	0.449	19
LOME	0.428	20
OUAGADOUGOU	0.367	21
ABIDJAN	0.346	22
DAR ES SALAAM	0.317	23
BAMAKO	0.307	24
MAPUTO	0.300	25
NIAMEY	0.278	26
DAKAR	0.275	27
ALGIERS	0.268	28
YAOUNDE	0.188	29
N'DJAMENA	0.159	30
KHARTOUM	0.152	31
LIBREVILLE	0.127	32
NOUAKCHOTT	0.116	33
JUBA	0.099	34
FREETOWN	0.042	35
CONAKRY	0.000	36

Kigali

Strength: Security: One of the safest cities in Africa with low crime rates. Rapid Development: Fast-growing infrastructure, including roads, buildings, and tech hubs. Tech Hub: Emerging as a center for tech innovation and startups in East Africa.

Opportunity: BRT system, Affordable Housing: Demand for affordable housing outpacing supply.

Resident's Perceptions: Residents utilize public transport and shared motorbike rides for their daily commutes, reflecting a diverse satisfaction rate. Many citizens feel proud of the clean, safe, and organized environment.



Mobility & Access Highlights

Accra

Strength: BRT System: A growing economy with a strong service and trade sector. A young and entrepreneurial population driving innovation.

Opportunity: smart Traffic Solution, Overflowing waste and limited recycling facilities.

Resident's Perceptions: Residents in Accra make use of car-sharing services and have expressed a desire for public buses running between towns to improve connectivity.



Addis Ababa

Strength: Pedestrian and bicycle lane, EV incentive, Expanding green spaces and parks.

Opportunity: BRT System, Rapid population growth leading to strained infrastructure.

Resident's Perceptions: residents use car-sharing services, but the satisfaction rate is relatively low. They have suggested improvements in safety, digitized payment systems, timely accessibility, and favorable regulations to enhance the overall experience and efficiency of car-sharing in the city.



Kampala

Strength: Dynamic, innovative workforce

Opportunity: Heavy traffic and frequent gridlocks, especially during peak hours. Poor waste disposal systems and littering in some areas.

Resident's Perceptions: Residents in Kampala use motorbike ride-sharing services and public transport but their satisfaction with these services is low. Rising concerns over waste management and air pollution.

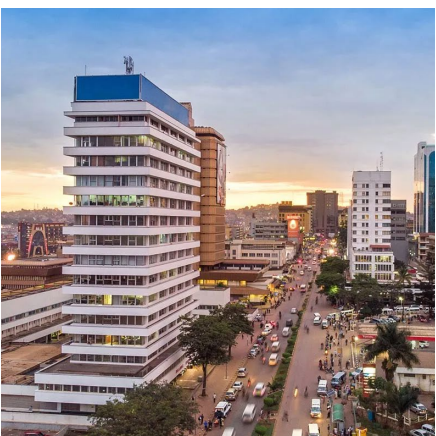


Nairobi

Strength: BRT system, Thriving startup and tech ecosystem.

Opportunity: Smart Traffic Solution, Limited affordable housing options.

Resident's Perceptions: residents typically spend 30-60 minutes on public transport, most don't use ride-sharing services, and satisfaction with public transport is moderate, with many suggesting improved accessibility.

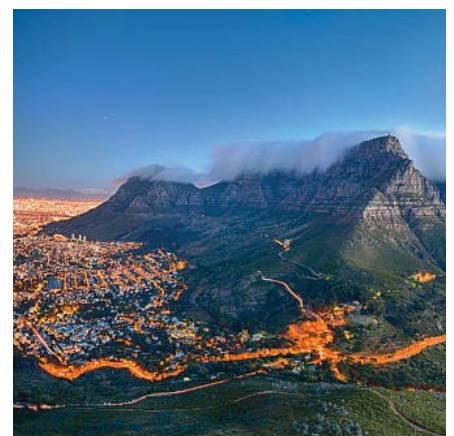


Cairo

Strength: Rich history and world-renowned landmarks.

Opportunity: Overcrowding and rising housing demand.

Resident's Perceptions: Frustration with long commutes, Optimism for better infrastructure and living standards.



3.3. Smart Economy and Innovation

The Smart Economy and Innovation pillar evaluates how cities foster economic growth, technological advancement, and sustainability through strategic policies and infrastructure. It focuses on integrating innovative solutions into urban economies to create environments where businesses thrive, new technologies emerge, and sustainability is prioritized. The African Smart City Index 2024 evaluates and ranks 36 African cities based on their smart economy and innovation efforts across four categories: Infrastructure Economy, Innovation and Technology, Business and Market Dynamics, and Green Economy and Sustainability. 12 key indicators were utilized to assess this pillar. These include the percentage of households with access to broadband, ICT development, innovation institutions, human capital and research, innovation infrastructure, knowledge and technology output, creative outputs, startup status compared globally, market sophistication, business sophistication, ease of doing business, the number of fintech startups, the number of tech startups funded in 2023, and circular economy initiatives. The goal is to create more resilient, competitive, and sustainable urban economies that can adapt to the evolving needs of urban populations and drive long-term prosperity.

Top 5 ranked cities in smart Economy and Innovation category

Johannesburg

Lagos

Cairo

Nairobi

Port Louis



Johannesburg ranked first in the Smart Economy and Innovation pillar, excels in ICT development and fintech startups, along encourages policies for a circular economy (Reference City of Johannesburg - Knowledge Hub | Circle Economy Foundation). The city's initiatives include fostering innovation through the Smart City Strategy and Innovation Framework, which modernizes service delivery methods and encourages employees and citizens to innovate. Johannesburg's vibrant fintech ecosystem and robust ICT infrastructure have positioned it as a smart economy and innovation leader, driving sustainable growth and technological advancement.



Lagos ranked second in the Smart Economy and Innovation pillar, and excels in creative output and global innovation. The city has seen a significant number of tech startups funded in 2023, and its robust fintech ecosystem has performed exceptionally well. These achievements, driven by supportive policies and a thriving entrepreneurial culture, position Lagos as a leader in fostering a dynamic and innovative economic environment.



Cairo is ranked third in the Smart Economy and Innovation pillar, excelling in global startup activity, innovative creative outputs, ICT development, and broadband access. The city's vibrant startup ecosystem and supportive policies have fostered significant innovation and growth. Since 2018, Cairo has established technology incubators and tech companies, which have contributed to the increasing number of funded tech startups and the expansion of fintech. This commitment to advancing technology and expanding internet access has positioned Cairo as a leader in fostering a dynamic and forward-thinking economic environment.

CITY	ASCIS 2024 Score in SMART Economy and Innovation	Rank
JOHANNESBURG	1.00	1
LAGOS	0.95	2
CAIRO	0.85	3
NAIROBI	0.85	4
PORT LOUIS	0.73	5
RABAT	0.72	6
GABORONE	0.64	7
TUNIS	0.63	8
ALGIERS	0.62	9
DAKAR	0.62	10
LIBREVILLE	0.62	11
ACCRA	0.61	12
WINDHOEK	0.59	13
LUSAKA	0.52	14
ABIDJAN	0.52	15
KIGALI	0.50	16
LOME	0.50	17
HARARE	0.48	18
ADDIS ABABA	0.47	19
KAMPALA	0.47	20
DAR-ES-SALAAM	0.45	21
LUANDA	0.42	22
ANTANANARIVO	0.38	23
MAPUTO	0.38	24
NOUAKCHOTT	0.37	25
YAOUNDE	0.36	26
N'DJAMENA	0.35	27
OUAGADOUGOU	0.35	28
FREETOWN	0.29	29
KINSHASA	0.29	30
LILONGWE	0.20	31
BAMAKO	0.18	32
CONAKRY	0.17	33
KHARTOUM	0.11	34
JUBA	0.11	34
NIAMEY	0.00	36

Johannesburg

Strength: Tech and fintech Startup, Educated and dynamic population

Opportunity: Inconsistent water and electricity supply

Citizens' Perceptions: Security is a top worry. Proud of the city's cultural mix.



Economy & Innovation Highlights

Lagos

Strength: Fintech startups

Opportunity: ICT Infrastructure economy

Resident's Perceptions: Residents in Lagos utilize various digital transactions for buying home goods, including bank transfers, mobile cash, PayPal, and POS machines.

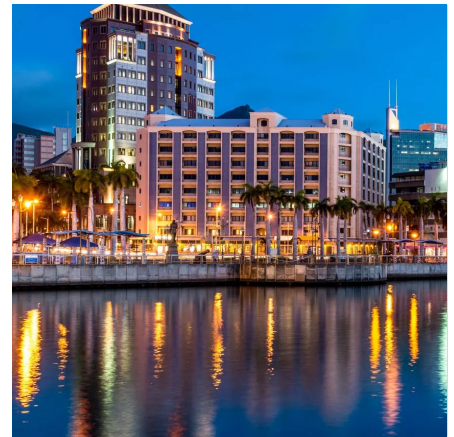


Cairo

Strength: Rich history and world-renowned landmarks.

Opportunity: Overcrowding and rising housing demand.

Resident's Perceptions: Frustration with long commutes, Optimism for better infrastructure and living standards.



Nairobi

Strength: tech startups, Digital transaction

Opportunity: ICT development

Resident's Perceptions: Residents in Nairobi perform daily digital transactions using various methods such as bank transfers, PayPal, mobile cash, and POS machines, and their satisfaction with these services is high.



Port Louis

Strength: Innovation Economy, Key gateway for imports and exports. Beautiful beaches and cultural attractions.

Opportunity: Limited space for growth. Need for better recycling systems.

Citizen's perceptions: Pride in the city's diversity.

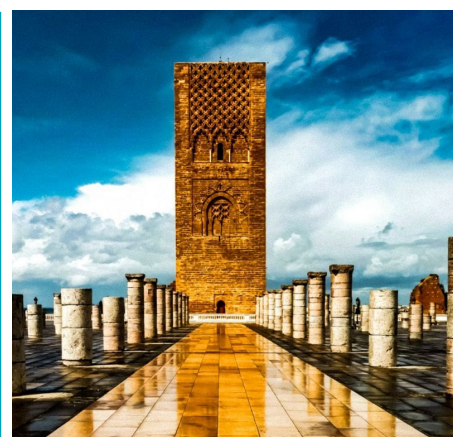


Rabat

Strength: % of households with access to internet

Opportunity: Tech startup's economy

Residents' Perceptions: Residents in Rabat use bank transfers and mobile cash for shopping and report high satisfaction with these digital transaction methods.



3.4. Smart Environment and Integration Pillar

The Smart Environment and Integration pillar assesses how cities utilize technology and sustainable practices to address environmental challenges, promote ecological health, and foster resilience against climate change. It evaluates urban efforts to integrate green initiatives with digital solutions to create cleaner, more sustainable living environments. Key areas of assessment include Environmental Sustainability, Climate Resilience, and Resource Efficiency. Indicators such as waste recycling rates, air quality monitoring through IoT-enabled sensors, and renewable energy adoption highlight cities' commitments to reducing their carbon footprints. The integration of smart technologies in water management, energy-efficient infrastructure, and urban green spaces reflects efforts to balance rapid urbanization with environmental preservation.

The African Smart City Index 2024 ranks 36 African cities based on their progress in implementing eco-smart initiatives and integrating technology for sustainable urban management. Data sources include environmental metrics, global indices such as the Environmental Performance Index (EPI), and reviews of local policies and infrastructure. High-ranking cities showcase innovative practices, such as AI-driven climate models, community-based sustainability programs, and smart energy grids that support renewable energy transitions. The evaluation underscores the importance of a tech-driven approach to ecological stewardship and highlights the need for improved data-driven policies and resource management. This pillar emphasizes that smart environmental integration is essential for creating urban ecosystems that thrive in harmony with nature.

Top 5 ranked cities in smart Economy and Innovation pillar

Accra

Nairobi

Libreville

Kigali

Harare

Accra has been ranked 1st in smart environment and integration, showcasing its strength in urban electric access and highlighting opportunities for setting recycling targets. This achievement reflects Accra's commitment to creating a sustainable and efficient urban environment through innovative practices and policies. The city's focus on improving environmental sustainability and integrating smart solutions has positioned it as a leader in this area.

Nairobi has been ranked second in smart environment and integration, demonstrating its strength in urban electric access and highlighting opportunities for e-waste management and recycling. The city's commitment to leveraging technology for sustainable urban development is evident in its high scores for access to improved water, sanitation, and clean energy.

Libreville has been ranked third in smart environment and integration, showcasing its strength in urban electric access and renewable energy. The city has significant opportunities for improvement in e-waste management and recycling. This ranking reflects Libreville's commitment to leveraging technology for sustainable urban development and improving the quality of life for its residents



CITY	ASCIS 2024 Score in SMART ENVIRONMENT AND INTEGRATION	Rank
ACCRA	1.00	1
NAIROBI	0.91	2
LIBREVILLE	0.84	3
KIGALI	0.82	4
HARARE	0.81	5
YAOUNDE	0.81	6
LUSAKA	0.80	7
KAMPALA	0.79	8
DAR ES SALAAM	0.78	9
ABIDJAN	0.76	10
WINDHOEK	0.76	11
GABORONE	0.75	12
JOHANNESBURG	0.75	13
DAKAR	0.75	14
KHARTOUM	0.74	15
LAGOS	0.69	16
LOME	0.68	17
LUANDA	0.67	18
OUAGADOUGOU	0.62	19
NOUAKCHOTT	0.57	20
ADDIS ABABA	0.55	21
BAMAKO	0.54	22
MAPUTO	0.52	23
LILONGWE	0.48	24
ANTANANARIVO	0.39	25
CONAKRY	0.38	26
NIAMEY	0.37	27
KINSHASA	0.36	28
FREETOWN	0.35	29
N'DJAMENA	0.33	30
CAIRO	0.09	31
JUBA	0.09	32
RABAT	0.09	33
TUNIS	0.07	34
PORT LOUIS	0.01	35
ALGIERS	0.00	36

Accra

Strength: Urban Electric access, Key West African trade city.

Opportunity: Recycling targets, Frequent floods due to poor drainage.

Citizen's perceptions: Optimism about city improvements. Worry about waste and drainage issues.



Environment & Integration Highlights

Nairobi

Strength: Urban Electric Access

Opportunity: E-waste Management and recycling, renewable energy



Libreville

Strength: Urban electric access and renewable energy

Opportunity: E-waste Management and Recycling



Kigali

Strength: Urban electric access, E-waste policy

Opportunity: Clean Energy Access



Strength: Innovation Economy

Opportunity: E-waste Management and Recycling



Yaounde

Strength: Renowned universities and institutions.

Opportunity: Inefficient collection and disposal. Unreliable and insufficient systems.

Citizen's perceptions: Frustration with congestion.





Living & Well-being



3.5 . Smart Living and Well-Being

The Smart Living and Well-Being pillar evaluates how cities leverage technology to enhance the quality of life, health, and safety of their residents. It focuses on integrating innovative solutions into urban living to create environments where individuals thrive physically, socially, and emotionally. Key areas of assessment include Health and Safety, Quality of Life, and Social Inclusivity. Indicators such as the availability of telemedicine platforms, IoT-enabled safety systems, and public health dashboards measure cities' efforts to improve health outcomes and safety. Quality of life is assessed through initiatives like smart housing, digital cultural platforms, and tech-enhanced recreational spaces. Social inclusivity indicators evaluate accessibility for people with disabilities, efforts to reduce the digital divide, and the presence of platforms for community participation.

The African Smart City Index 2024 ranks 36 African cities based on their progress in improving living standards and well-being through technology. Data sources include technology utilization metrics, resident surveys, benchmark indices like the Global Health Security Index (GHSI) and Digital Quality of Life Index (DQLI), and analyses of public policy and infrastructure. High-ranking cities demonstrate a strong commitment to health, safety, inclusivity, and quality of life, while the results also highlight areas for improvement, such as access to digital health solutions or inclusive public services. This evaluation emphasizes the role of smart living as a cornerstone for sustainable and human-centric urban development.

Top 5 ranked cities in smart Living and Well-being pillar

Johannesburg

Kampala

Abidjan

Nairobi

Kigali



CITY	ASCIS 2024 Score in SMART LIVING AND WELL BEING	Rank
JOHANNESBURG	1.000	1
KAMPALA	0.939	2
ABIDJAN	0.935	3
NAIROBI	0.927	4
KIGALI	0.921	5
LAGOS	0.861	6
ACCRA	0.843	7
OUAGADOUGOU	0.826	8
DAKAR	0.811	9
LUSAKA	0.788	10
WINDHOEK	0.787	11
DAR ES SALAAM	0.773	12
RABAT	0.763	13
CAIRO	0.729	14
MAPUTO	0.716	15
LOME	0.710	16
LILONGWE	0.696	17
YAOUNDE	0.676	18
BAMAKO	0.655	19
TUNIS	0.653	20
ADDIS ABABA	0.642	21
HARARE	0.639	22
NIAMEY	0.635	23
KINSHASA	0.628	24
PORT LOUIS	0.567	25
FREETOWN	0.551	26
LIBREVILLE	0.544	27
NOUAKCHOTT	0.543	28
CONAKRY	0.529	29
LUANDA	0.494	30
GABORONE	0.471	31
N'DJAMENA	0.469	32
ALGIERS	0.450	33
ANTANANARIVO	0.380	34
KHARTOUM	0.189	35
JUBA	0	36

Johannesburg ranks first in the Smart Living and Well-Being pillar, excelling in healthcare accessibility and electricity provision. With widespread access to healthcare facilities and ongoing investments in renewable energy projects, Johannesburg ensures reliable electricity access for its residents. Additionally, the city offers affordable and high-speed internet, reducing the digital divide and fostering social inclusivity. Initiatives promoting cultural engagement and recreational facilities further enhance residents' quality of life, making Johannesburg a leader in smart urban living.



Kampala, ranked second, stands out for its advancements in data affordability and mobile health services. Collaborative efforts between the government and telecom providers have significantly lowered internet costs, increasing digital inclusion. The city's adoption of telemedicine platforms has improved healthcare accessibility, particularly for underserved populations. Abidjan, in third place, demonstrates strong performance in social inclusivity and urban safety initiatives. Its community-centered approach integrates smart solutions into housing and safety measures, creating a more livable environment.

Nairobi, ranked fourth, excels in implementing public health dashboards and leveraging IoT for safety enhancements. Investments in digital health services, such as e-clinics, have improved healthcare delivery. Lastly, Kigali, ranked fifth, shines in promoting accessible public services and recreational spaces. Ongoing efforts to integrate technology into housing and cultural platforms, alongside its focus on sustainability, highlight Kigali's commitment to enhancing the well-being of its residents. Together, these cities set benchmarks for integrating technology into urban living to foster sustainable and inclusive development.

Johannesburg

Strength: Vibrant arts, music, and diversity. Rich history and attractions.

Opportunity: Persistent security concerns. Gaps in affordable housing access.

Citizen's perceptions: Security is a top worry. Proud of the city's cultural mix.



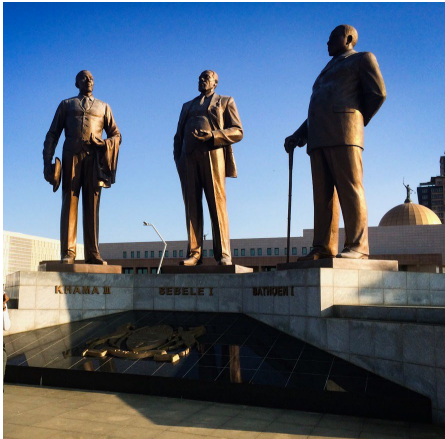
Living & Well-being

Kampala

Strength:

Opportunity: Mobile health awareness

Residents Perceptions: Residents emphasize the need for improved healthcare services, including more specialists and mobile health awareness, alongside better infrastructure such as roads, amenities, and clear signage. They also advocate for reduced costs of electricity, stricter regulation of street vending to maintain cleanliness, and increased public sensitization on proper waste disposal practices.



Abidjan

Strength: A young and entrepreneurial population driving innovation.

Opportunity: Rising air pollution due to increasing traffic and industrial activity. Inadequate waste disposal systems and recycling programs.

Citizens' perceptions: Citizens frequently express frustration with traffic jams.



Nairobi

Strength: Rich heritage and vibrant arts scene.

Opportunity: Rapid expansion strains infrastructure.

Resident's Perceptions: Residents of Nairobi prioritize access to affordable and comprehensive healthcare, emphasizing the need for qualified doctors, advanced medical equipment, efficient emergency services, and improved sanitation in public hospitals. They call for better urban infrastructure, including good roads, controlled drainage systems, and smart traffic management. Additionally, there is strong support for sustainable initiatives such as pollution reduction, energy-saving technologies, cycling lanes, and bike-sharing services, alongside efforts to improve internet connectivity and public power ports. Enhanced quality of life through reduced taxation, inflation control, and smart city initiatives championed by the government and SMEs is a shared aspiration.



Kigali

Strength: Business-friendly policies attracting local and international investments.

Opportunity: Demand for affordable housing outpacing supply.

Resident's Perceptions: Residents emphasize the need for enhanced healthcare services, including expanded insurance coverage, more skilled medical personnel, better diagnostic tools, and improved customer care. They also advocate for accessible parks, reliable public transportation, improved waste management, and digital connectivity to foster inclusivity and elevate urban living standards. Environmental sustainability, equitable resource distribution, and smarter urban planning are seen as critical for achieving a higher quality of life.



Lagos

Strength: Leading business center, Thriving startup and tech ecosystem.

Opportunity: Limited affordable housing options.

Resident's Perceptions: Residents of Lagos emphasize the importance of improving patient care through better-equipped hospitals, an empathetic and prompt service delivery system, and increased laboratory staff. They also highlight the need for enhanced greenfield infrastructure, connectivity, and renewable energy technologies, alongside spaces such as playgrounds for children. Conservation of nature and better urban infrastructure are seen as vital for sustainable and inclusive development in a smart city context.



4. CONCLUSION

Smart Cities: Accelerators of Urban Transformation

The Africa Smart City Index 2024 highlights the transformative potential of smart city initiatives in addressing the continent's most pressing urban challenges. By leveraging technology and data-driven solutions, cities are tackling issues related to governance, mobility, economy, environment, and living standards. Smart cities go beyond infrastructure upgrades, they represent a holistic approach to improving urban living, fostering innovation, and ensuring sustainability. The index evaluates cities across five core categories: Smart Governance and Strategy, Smart Mobility and Access, Smart Economy and Innovation, Smart Environment and Integration, and Smart Living and Wellbeing. These dimensions reflect a city's ability to implement innovative, inclusive, and sustainable solutions tailored to its unique challenges.

Inclusive and People-Centric Economies

Smart cities prioritize inclusivity by ensuring that urban innovations benefit all citizens. Indicators such as access to e-governance platforms, the strength of public transportation networks, and investments in renewable energy highlight how cities are becoming more people-centered. Cities like Johannesburg, Nairobi, and Kigali lead the rankings due to their advancements in governance, innovation ecosystems, and public service delivery. These cities demonstrate how combining political will, technological adoption, and citizen engagement can create thriving economies that improve living standards and foster prosperity.

Harnessing Africa's Unique Advantages

Africa's youthful and tech-savvy population provides a significant advantage in adopting and scaling smart city solutions. Cities are using this demographic edge to innovate in areas such as digital infrastructure, environmental sustainability, and entrepreneurship. The index's indicators, such as renewable energy usage, non-motorized transport solutions, and digital economy contributions to GDP, reveal how cities like Lagos and Kampala are emerging as rising stars. These cities demonstrate how embracing environmental stewardship, fostering startup ecosystems, and ensuring connectivity can drive equitable growth and resilience.

A Blueprint for Sustainable Urban Futures

The Africa Smart City Index 2024 serves as both a benchmarking tool and a roadmap for African cities to achieve sustainable development. Its indicators measure performance in areas such as urban governance, innovation capacity, and environmental integration, offering actionable insights for policymakers and stakeholders. For instance, cities are ranked on criteria like broadband subscriptions, the presence of circular economy commitments, and access to telehealth services, underscoring the importance of aligning strategies with measurable outcomes. By fostering collaboration across sectors and learning from one another's successes, African cities are paving the way for vibrant, inclusive, and prosperous urban environments that can thrive in a rapidly changing world.

Through its holistic evaluation and practical recommendations, the index underscores that smart cities are not merely a vision but a proven pathway for African nations to address urbanization challenges and create a brighter, more sustainable future for all.

5. ACKNOWLEDGEMENTS

We extend our heartfelt gratitude to the individuals and institutions who played a pivotal role in the realization of the **Africa Smart Cities Index 2024**. Your unwavering support, expertise, and guidance have been instrumental in this ambitious initiative, aimed at accelerating the growth of smart and sustainable urban centers across the continent.

Mr. Rafi Rich

Executive Director of the Jerusalem Centre of Urban Innovation

Your unparalleled expertise in urban innovation and your passion for sustainable development have been instrumental in shaping this index. Your ability to align global best practices with the unique needs of African cities has ensured that the findings remain relevant and impactful. Your vision has greatly contributed to advancing the dialogue on Africa's urban transformation.

Mr. Bruno Lanvin

President of the Smart City Observatory at the International Institute for Management Development (IMD)

Your exemplary leadership in global smart city governance and your commitment to excellence have been vital to the success of this project. By establishing robust benchmarks and fostering actionable insights, your guidance has elevated this index into a valuable tool for urban transformation across Africa.

High-Level Africa Smart City Index Advisory Board

We extend our deepest appreciation to the esteemed members of the **Africa Smart City Index Board**. Their strategic oversight, rigorous analysis, and diverse expertise have been instrumental in the success of this project. By ensuring the credibility, accuracy, and context-specific relevance of the methodology, they have made a lasting contribution to the future of African cities. Their collective efforts, alongside the dedicated work of the research team, have ensured a comprehensive and reliable assessment of smart city initiatives across Africa.

- **Mrs. Robin Miller**, Founding Partner at AxumEarth: With her deep expertise in urban planning and sustainable development, Mrs. Miller has provided critical guidance in refining the index's methodology and ensuring that sustainability remains a core pillar of the evaluation process.
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- **Mrs. Alice Higirow**, Project Director for Smart Cities, Rwanda: An expert in environmental sustainability, Mrs. Higirow's contributions have ensured that ecological priorities, such as renewable energy and circular economy commitments, remain integral to the index's framework.
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To all individuals and organizations involved in the development of this index—whether through direct collaboration or indirect support—we express our heartfelt thanks. Together, we are shaping a brighter future for urban living across Africa, paving the way for smarter, more sustainable, and inclusive cities that showcase the continent's immense potential for innovation and growth.