Africa Smart Cities Investment Summit

Dala Africa

African Smart City Index 2023

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Executive Summary

The inaugural edition of the African Smart City Summit ranks 30 cities across the continent across 5 categories.

The Africa Smart and Sustainable Cities index aims to provide a comprehensive assessment of the progress African cities are making towards becoming smart and sustainable. While other global city indexes exist, they often lack sufficient coverage of African cities or fail to account for the unique challenges and opportunities cities in Africa face. This new index will benchmark African cities across critical dimensions like infrastructure, technology adoption, environmental sustainability, quality of life, and resilience. By identifying leaders and laggards, highlighting best practices, and tracking year-over-year progress, the index can guide policymaking and investments to help African cities realize their full potential as centers of innovation and growth while ensuring improved livability, inclusion, and sustainability. Overall, the index will paint a nuanced picture of the state of smart city development in Africa and offer data-driven insights to help accelerate progress.

Top 5 cities

1. Kigali
2. Tunis
3. Nairobi
4. Cape Town
5. Accra

Economy & Innovation

1. Johannesburg
2. Nairobi
3. Accra
4. Lagos
5. Tunis

Mobility & Access

1. Cape Town
2. Nairobi
3. Accra
4. Lagos
5. Tunis

Governance & Strategy

1. Kigali
2. Nairobi
3. Cape Town
4. Rabat
5. Tunis

Living and Wellbeing

1. Tunis
2. Kigali
3. Cape Town
4. Port Louis
5. Gaborone

Environment & Integration

1. Port Louis
2. Cape Town
3. Kigali
4. Tunis
5. Accra

The Importance of Smart Cities

Socially, smart cities allow for better, more efficient public resources. These range across all government services from healthcare to security and policing. In some instances, it also sees the implementation of brand-new systems which allows for easy integration of historically marginalised groups such as women, lower income earners and the youth

Economically, smart cities help governments and individuals manage money better by identifying areas for possible saving or further investment. Smart cities are also hubs for job creation, skill development and other directly economically impactful activities. For example, the implementation of smart technology has reportedly generated a 5% increase in economic activity across 5 major US cities (Atlanta, Boston, Kansas City, San Francisco, and Washington DC). (Musa, 2017).

Environmentally, smart cities give the ability to monitor and measure environment affecting activity e.g. emissions, energy and water usage. Smart cities can also optimise other services that have environmental impact e.g. refuse collection, energy efficient street lights and giving people the ability to work remotely (leading to less travel time in greenhouse gas emitting vehicles).

Smart Cities in an African Context

The concept of smart cities is one that was typically associated with the most developed nations around the world. The Smart City Expo 2022 demonstrated electric bicycle and car concepts, talking AI robots and other innovative technologies. Although some of these technologies are not directly applicable to developing countries due to limited digital infrastructure and capabilities, it does not negate the need to adopt the concept of smart cities to African countries.

Increased migration to cities has put pressure on countries to develop quickly. People continue to migrate to urban areas for a better standard of living, job opportunities or insecurity in their original settlement. The number of people migrating into cities has spiked since the end of the COVID-19 pandemic in order to curb the harsh financial impact of the virus. Cities in Africa can use the technology of smart cities to create infrastructure that better serves their ever-increasing populace.

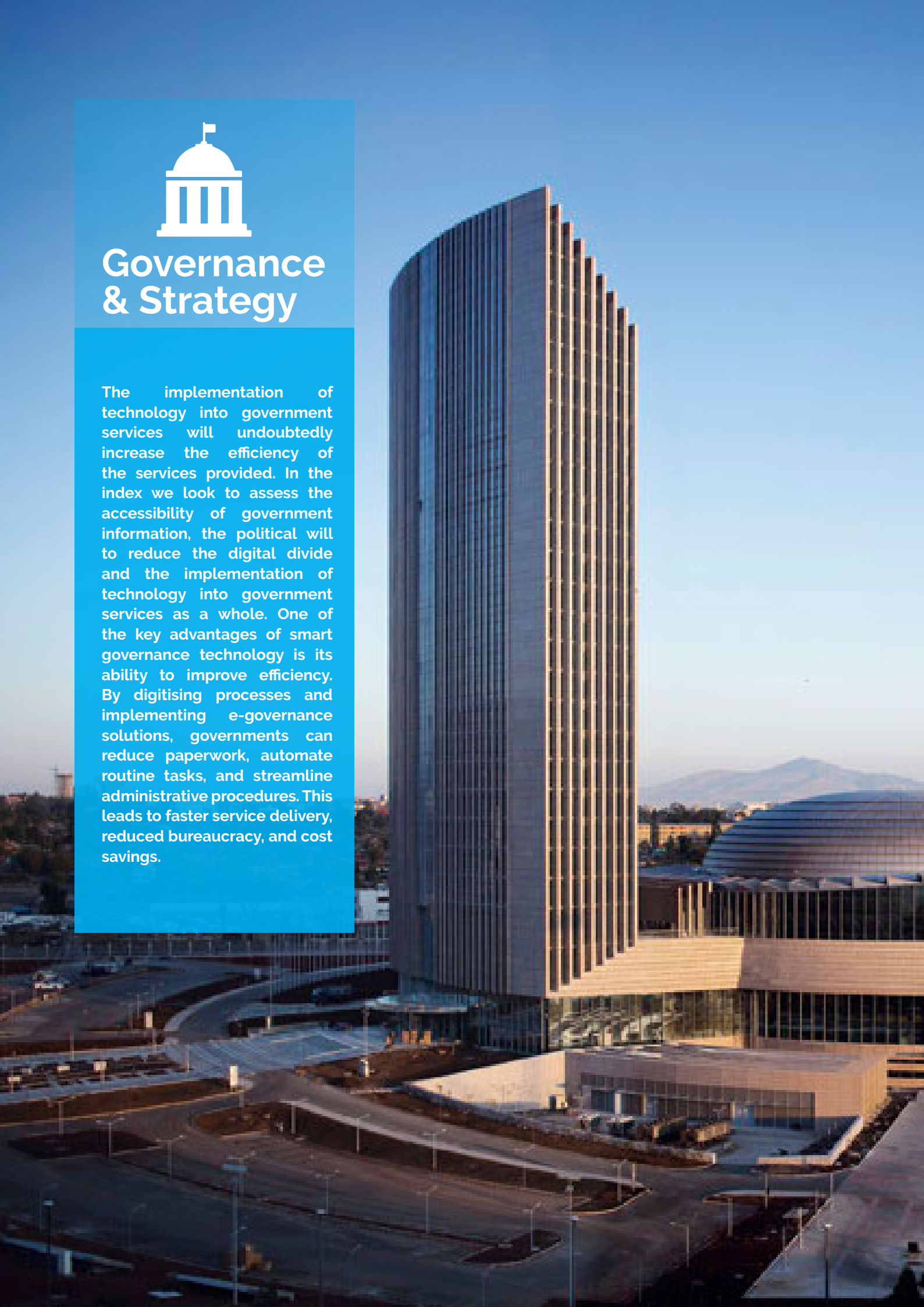
Population growth has skyrocketed in Africa, leading to an increasing number of cities and urban settlements. As of today, Africa has a total of 3 mega cities (a city with at least 10 million inhabitants) had emerged (Cairo, Kinshasa and Lagos), providing a home for a total of 35 million people, with an additional 4 expected to sprout in Africa by 2050 (Dar es Salaam, Nairobi, Khartoum and Luanda) the clock to build smart cities has started to tick.

Flexibility to develop new systems and learn from the errors made by developed countries is a unique advantage that cities in Africa have. Boosting the efficiency of public resources has been the most successful application of technology in developing cities we have seen today. Cities in Africa also have room for expansion, allowing them to easily add and adopt new infrastructure into their cities.

Foreign direct investment (FDI) remains a key source of external finance for developing countries. The ability to attract it on a consistent basis has direct implications on a country's economic capacity and overall development. Countries in Africa are keen to show the world that they can also be homes for technological advancements. Kenya especially has taken strides to achieving this goal and is now popularly referred to as the Savannah Valley, the country's version of the United States' Silicon Valley revered for its tech landscape. Doing so increases their ability to attract foreign direct investment (FDI), bettering their prospects for international partnerships and sustainable growth.

Economic diversification has also been difficult for many African countries who are stuck in the raw materials resource provision for other finished goods. A majority of African countries have relied on natural resources to support their economies but with fluctuating prices and demand, there is a need to further diversify the economies involved. The new digital era brings in a fresh opportunity for African cities to do so. Their unique position allows cities to leapfrog certain unsuccessful trends and latch on to tried and tested methods from more developed countries. The digital economy of Africa is projected to contribute only 5.2% to the continent's GDP by 2025 compared to the 10.5% it currently contributes to the US economy alone.

Overall Africa Smart City
Index Ranking



Governance & Strategy

The implementation of technology into government services will undoubtedly increase the efficiency of the services provided. In the index we look to assess the accessibility of government information, the political will to reduce the digital divide and the implementation of technology into government services as a whole. One of the key advantages of smart governance technology is its ability to improve efficiency. By digitising processes and implementing e-governance solutions, governments can reduce paperwork, automate routine tasks, and streamline administrative procedures. This leads to faster service delivery, reduced bureaucracy, and cost savings.

Furthermore, smart governance technology promotes transparency and accountability, which has been notably lacking in some cities. Digital platforms enable governments to provide access to public information, budgets, and government services. This helps in combating corruption, as transparency acts as a deterrent. Moreover, digital platforms can facilitate citizen participation and engagement, allowing citizens to provide feedback, voice concerns, and participate in decision-making processes. This adds a layer of inclusivity to the government that some demographics may have felt isolated from, leading to a more responsive and citizen-centric policies and services.

To effectively implement smart governance technology, cities need to prioritise investment in digital infrastructure, promote digital literacy, and ensure data security and privacy. Collaboration between governments, private sector entities, and civil society organisations is crucial in ensuring these technologies are suitable for all citizens. Additionally, strong political will and regulatory frameworks need to be in place to ensure the sustainability and inclusivity of e-governance. By embracing smart governance technology, African countries can drive sustainable development, improve service delivery, and empower their citizens in the digital age.

City	Rank
Kigali	1
Tunis	2
Nairobi	3
Capetown	4
Accra	5
Lagos	6
Rabat	7
Port Louis	8
Cairo	9
Johannesburg	10
Gabarone	11
Abidjan	12
Algiers	13
Kampala	14
Dakar	15
Adis Ababa	16
Windhoek	17
Luanda	18
Abuja	19
Lusaka	20
Dar es Salaam	21
Freetown	22
Libreville	23
Maputo	24
Harare	25
Lome	26
Kinshasa	27
Ougadougou	28
Nouakchott	29
N'Djemena	30

Indicators Measured to Measure Governance & Strategy

- Presence of smart city policy and masterplans
- Digital access to municipal services
- Ease of access to government files and public data

Governance & Strategy Highlights

Kigali
Rwanda

1

Strengths: Access to e-services
Opportunities: Access to public data


Kigali

Nairobi
Kenya

2

Strengths: Access to public data, smart city policies


Rabat

Cape Town
South Africa

3

Strengths: Access to public data

Opportunities: Smart city policies


Cape Town

Rabat
Morocco

4

Strengths: Access to eservices

Opportunities: Access to public data

Tunis
Tunisia

5

Strengths: Access to eservices

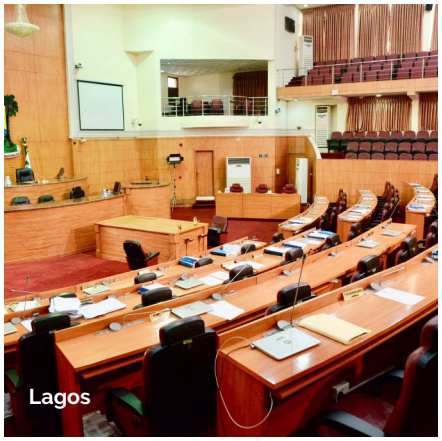
Opportunities: Access to public data

Lagos
Nigeria

6

Strengths: Access to public data

Opportunities: Access to e-services


Lagos

Accra
Ghana

7

Strengths: Access to public data

Opportunities: Smart city policies

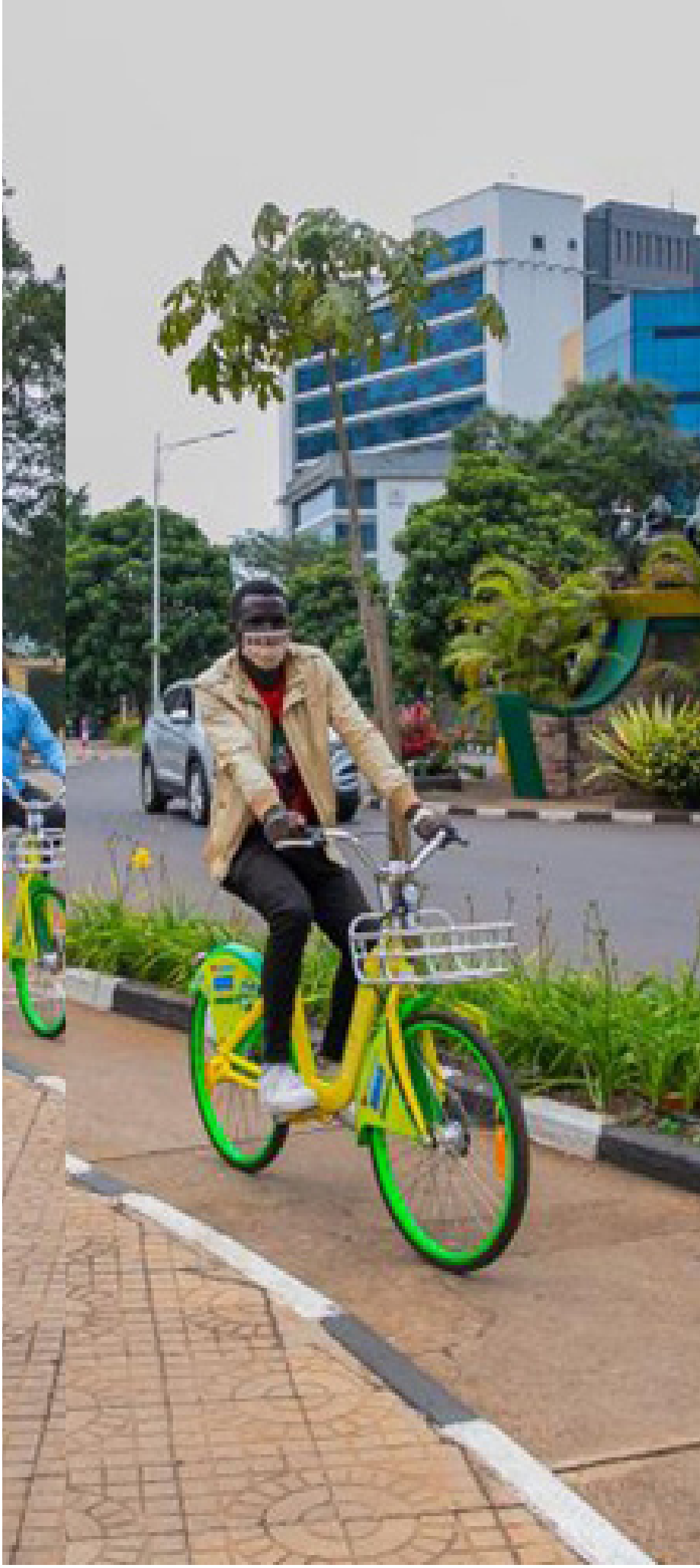
Mobility and Access

With the increasing population in cities, roads and public transportation have seen an increased burden on their services. The need to increase the capacity and efficiency of transportation systems and services should not be understated as it is an integral part of city life for all citizens. The index aims to see how the implementation of technology has increased this efficiency with the use of real time travel data, public transport accessibility.

Smart mobility technology offers numerous benefits to African cities, including improved traffic management, enhanced public transportation systems, and increased connectivity. Advanced traffic management systems, enabled by technologies like real-time traffic monitoring, data analytics, and intelligent signalling, can help optimise traffic flow, reduce congestion, and minimise travel time.

Efficient public transportation systems, powered by smart technologies, can provide affordable and reliable options for citizens, reducing reliance on private vehicles and decreasing traffic congestion and emissions. Additionally, smart mobility solutions can enhance connectivity by integrating different modes of transportation, such as buses, taxis, and train systems, through integrated platforms and mobile applications, making it easier for citizens to plan and navigate their journeys.

Furthermore, the collection and analysis of transportation data, including traffic patterns, passenger demand, and infrastructure performance, are crucial for optimising transport systems and making informed decisions. Collaboration between government entities, private sector stakeholders, and technology providers is necessary to develop and deploy smart mobility solutions effectively. By embracing smart mobility technology, African cities can transform their transportation systems, improve accessibility and efficiency, and enhance the overall mobility experience for their citizens.



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Ouagadougou	23
Freetown	24
Harare	25
Kinshasa	26
Lome	27
Libreville	28
Nouakchott	29
N'Djamena	30

Indicators Measured Mobility and Access

- Implementation of smart traffic management solutions
- Policies to reduce air and noise pollution caused by traffic
- Implementation of urban mobility masterplans
- Alternatives to non-motorised transport
- Presence and strength of BRT transportation

Mobility & Access Highlights

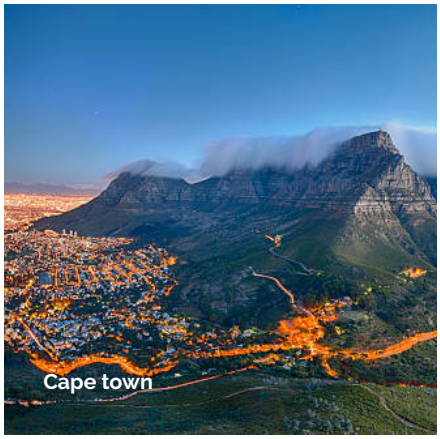
Cape Town 1
South Africa

Strengths: Non-motorised transport, traffic management, smart traffic solutions

Nairobi 2
Kenya

Strengths: BRT systems, non-motorised transport

Opportunities: smart traffic solutions


Cape town

Accra 3
Ghana

Strengths: BRT systems

Opportunities: smart traffic solutions


Rabat

Lagos 4
Nigeria

Strengths: BRT systems

Opportunities: smart traffic solutions, non-motorised transport


Tunis

Tunis 5
Tunisia

Strengths: Urban mobility masterplan
Opportunities: non-motorised transport

Kigali 6
Rwanda

Strengths: Non-motorised transport
Opportunities: BRT systemm


Abidjan

Rabat 7
Morocco

Strengths: Smart traffic solutions

Opportunities: Urban mobility masterplan

Economy & Innovation

A smart economy holds immense importance for the development of African cities. With the rapid urbanisation and population growth in many African countries, there is a pressing need to foster economic growth, create jobs, and improve living standards. A smart economy, driven by technology and innovation, can play a pivotal role in achieving these objectives. By leveraging digital solutions and connectivity, African cities can enhance their productivity, competitiveness, and sustainability. The index looks to encompass this by looking at a city's connectivity, digital technology for economic activity and the groundwork being put in place to foster and sustain these changes.

One crucial aspect of a smart economy is the promotion of digital infrastructure and connectivity. By investing in high-speed internet access, reliable communication networks, and data centres, African cities can unlock tremendous opportunities for economic growth. This connectivity enables businesses to access global markets, facilitates e-commerce and digital payments, and encourages innovative entrepreneurship. Moreover, a smart economy encourages the development of digital skills among the workforce, equipping them with the tools to participate in the digital economy. This leads to job creation, reduced unemployment rates, and improved income levels, contributing to poverty reduction and socioeconomic development in African cities.

Additionally, a smart economy promotes sustainability by optimising resource usage, reducing energy consumption, and enabling smart transportation and waste management systems, thereby creating cleaner and more liveable cities. Overall, embracing a smart economy in African cities can drive inclusive and sustainable development, empowering individuals, businesses, and communities to thrive in the digital age.

City	Rank
Johannesburg	1
Nairobi	2
Lagos	3
Tunis	4
Rabat	5
Cairo	6
Kigali	7
Dakar	8
Accra	9
Kampala	10
Port Louis	11
Algiers	12
Gaborone	13
Abidjan	14
Capetown	15
Libreville	16
Windhoek	17
Luanda	18
Addis Ababa	19
Dar es Salaam	20
Harare	21
Lome	22
Abuja	23
Lusaka	24
N'Djamena	25
Nouakchott	26
Ouagadougou	27
Freetown	28
Kinshasa	29
Maputo	30

Indicators Measured for Economy and Innovation

- Fixed broadband subscriptions
- % of GDP spend on research and development
- Digital economy contributions to GDP
- MSME managemnt

Economy & Innovation Highlights

Johannesburg 1
South Africa

Strengths: % of GDP spent on research

Opportunities: Digital economy contributions to GDP

Nairobi 2
Kenya

Strengths: MSME management

Opportunities: Fixed broadband availability

Lagos 3
Nigeria

Strengths: Digital economy contributions to GDP

Opportunities: Fixed broadband availability

Tunis 4
Tunisia

Strengths: Digital economy contributions to GDP
Opportunities: MSME management

Rabat 5
Morocco

Strengths: Fixed broad availability

Opportunities:MSME management

Cairo 6
Egypt

Strengths: Digital economy contributions to GDP

Opportunities: Fixed broad availability

Kigali 7
Rwanda

Strengths: MSME management

Opportunities: % of GDP spent on research

Environment & Integration

Smart environmental management is of utmost importance for the development of African cities. As urbanisation and industrialisation continue to accelerate across the continent, there is a growing need to address environmental challenges to ensure sustainable growth. By adopting smart environmental management practices, African cities can mitigate the impact of urban development on natural resources, protect ecosystems, and improve the overall quality of life for their residents.

One significant benefit of smart environmental management is the preservation of natural environments. Through the implementation of smart technologies and sustainable practices, such as renewable energy systems, efficient waste management, and water conservation measures, cities can minimise their ecological footprint and protect these valuable resources. By doing so, they ensure a more resilient and sustainable future, while also doing their part to decrease global CO_2 emissions and attract green investments which can contribute to local economic development.

Furthermore, smart environmental management enhances the liveability of African cities. By addressing air and water pollution, reducing noise levels, and improving waste management systems, cities can create healthier and more pleasant living environments for their residents. Smart environmental management also promotes the concept of green spaces and urban parks, providing recreational areas and contributing to the overall well-being of citizens. Additionally, by adopting climate change adaptation strategies, such as resilient infrastructure and green construction techniques, African cities can better prepare for and respond to the challenges posed by a changing climate.

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Port Louis	1
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Indicators Measured for Enviroonment and Integration

- Levels of pollution in city
- Percentage of the population with access to electricity
- Energy generated from renewable sources
- Renewable energy and circular economy commitments

Environment & Integration Highlights

Port Louis
Mauritius

1

Strengths: Levels of pollution

Opportunities: circular economy commitments

Cape Town
South Africa

2

Strengths: Energy generated from renewables

Opportunities: Access to electricity

Kigali
Rwanda

3

Strengths: Circular economy commitments

Opportunities: Energy generated from renewables

Tunis
Tunisia

4

Strengths: Access to electricity

Opportunities:
Levels of pollution

Accra
Ghana

5

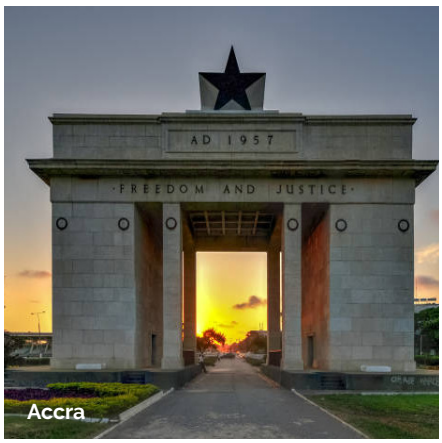
Strengths: Circular economy commitments
Opportunities: Levels of pollution

Nairobi
Kenya

6

Strengths: Circular economy commitments

Opportunities: Access to electricity



Accra

Windhoek
Namibie

7

Strengths: Levels of pollution

Opportunities: Energy generated from renewables

Living & Well-being

Smart living technology holds immense importance for African cities, particularly in the areas of healthcare, connectivity and utility usage and monitoring. The services provided around smart living are made to simplify the life of citizens in the city. They aim to improve access to existing services like healthcare, decrease the cost of utilities by providing for proper monitoring and improve connectivity through better and more widespread infrastructure.

In terms of healthcare, smart living technology can greatly enhance access to quality medical services in African cities where healthcare infrastructure may be limited. Through telemedicine and remote monitoring systems, individuals can receive medical consultations and monitoring from the comfort of their homes, reducing the need for physical visits to healthcare facilities. This technology enables healthcare professionals to reach more people, especially those in remote or underserved areas, ultimately improving health outcomes and reducing healthcare disparities.

Additionally, smart living technology plays a vital role in improving internet connectivity in African cities. By leveraging innovative solutions such as satellite-based internet services and mesh networks, internet access can be extended to previously underserved areas, connecting more individuals to the digital world. Improved internet connectivity fosters economic growth, facilitates online education and skill development, and enhances access to information and services, ultimately bridging the digital divide and empowering individuals and communities.

Moreover, the affordability of smart living technology, including smartphones, has the potential to revolutionise African cities. With the increasing affordability of mobile and broadband data and the rising penetration of smartphones, more people can access digital services, participate in e-commerce, and leverage mobile applications for various purposes. This democratisation of technology opens up avenues for economic empowerment, financial inclusion, and entrepreneurship, contributing to the overall development and prosperity of African cities.

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Kinshasa	26
Lome	27
Ouagadougou	28
Nouakchott	29
N'Djamena	30

Indicators Measured for Living and Wellbeing

- Alternatives to physical hospital visits; telehealth and telemedicine
- Data affordability
- Healthcare facilities per capita
- Average 4G download speed

Living & Well-being

Tunis
Tunisia

1

Strengths: Alternatives to hospital visits

Opportunities: Healthcare facilities per capital

Kigali
Rwanda

2

Strengths: Healthcare facilities per capita

Opportunities: 4G download speed

Cape Town
South Africa

3

Strengths: Alternatives to hospital visits

Opportunities: 4G download speed

Port Louis
Mauritius

4

Strengths: Mobile data affordability

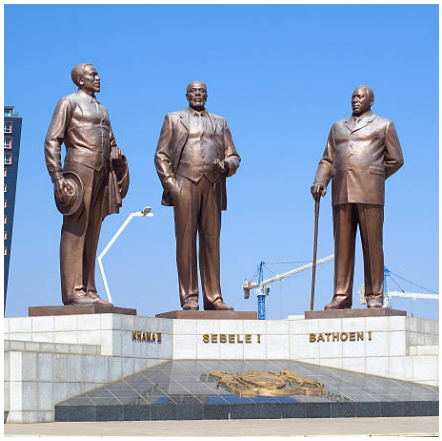
Opportunities: 4G download speed

Gaborone
Botswana

5

Strengths: Healthcare facilities per capita

Opportunities: Mobile data affordability



Cairo
Egypt

6

Strengths: Mobile data affordability

Opportunities:

Accra
Ghana

7

Strengths: Alternatives to hospital visits

Opportunities: Average 4G download speed

Conclusion

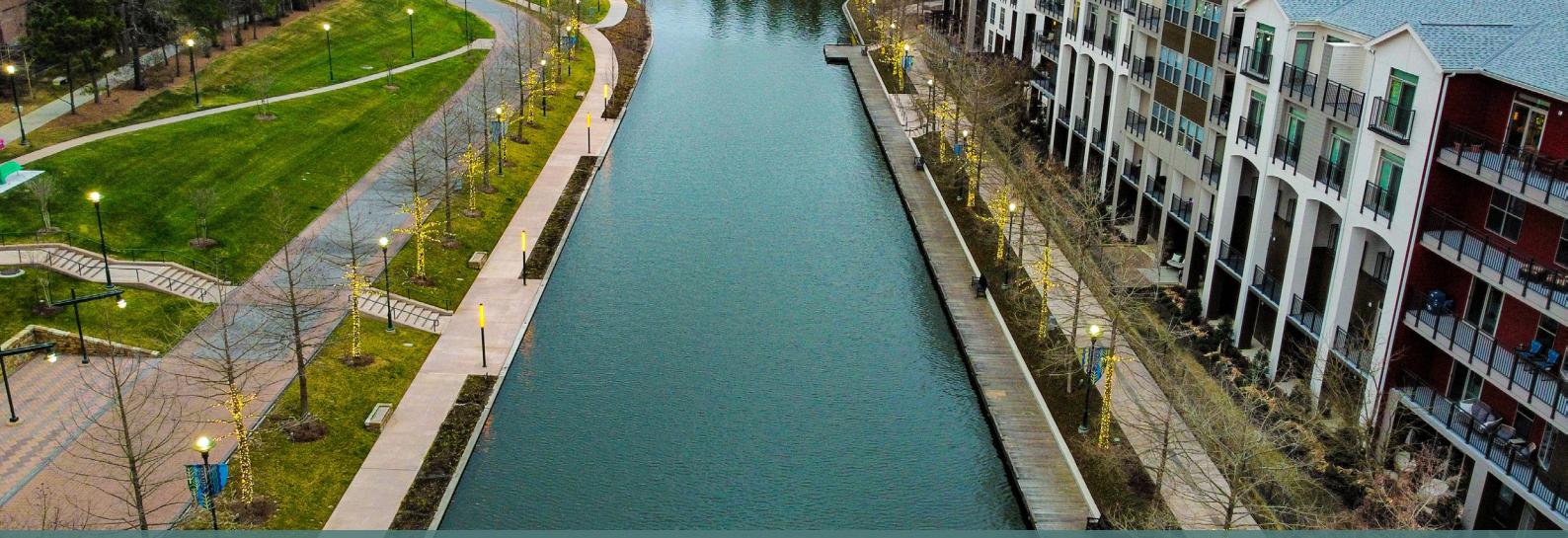
Smartness Accelerates Developments

A smart city index is a powerful tool in demonstrating how smartness leads to development in African countries. Smart cities leverage technology and data to enhance urban living, and this approach is particularly beneficial for African nations facing rapid urbanisation and developmental challenges.

African countries are uniquely positioned to benefit from smart city initiatives due to factors such as their young and tech-savvy populations, making them more adaptable to technology-driven solutions. Additionally, the adoption of smart city technologies can lead to improved infrastructure, efficient public services, and enhanced quality of life. These improvements are essential for sustainable development in Africa.

Inclusive Smartness

Furthermore, smart economies are people-centric, fostering inclusivity and prosperity, which are crucial components of development in African cities. In conclusion, the index can effectively illustrate how the implementation of smart city technologies leads to development in African countries. These technologies not only address the challenges posed by rapid urbanisation but also promote economic growth and enhance the overall quality of life for citizens, making them a valuable asset in Africa's path to sustainable development.



Research and Methodology

The African Smart City Index is the first of its kind so therefore relied on existing indices and research to curate its categories and sub indicators. The purpose of doing this was to avoid reinventing the wheel but instead reshaping it to fit the African context. The 5 categories were shaped by Smart Africa's report on the most important aspects to the development of smart cities in Africa. These categories were slightly modified to encompass smartness, inclusiveness and sustainability in different and also to promote investment opportunities across the continent.

These 5 categories are as follows; Governance & Strategy, Mobility & Access, Economy & Innovation, Environment & Integration and Living and Wellbeing. These 5 categories were then broken down into 3 to 4 sub indicators each, where we could assign scores based on the performance of each city in these categories. A benchmark was set in each category for the highest possible score in each category, dependent on the scores of the best performing cities. This was done in order to keep the index on a level playing field for Africa, using international standards will yield low scores for many cities because many of the cities involved in the index are in the early stages of their smart city journey compared to smart cities across the globe.

In order to maintain validity of this new index, indicators were drawn from internationally reputable sources such as the International Standards Organisation Smart City Indicators, IESE Cities in Motion Index, Digital Cites Index, Sustainable Development Goals; Structural Indicator for Developing a Smart City and The Smart City Observatory by IMD Business School. The team at Dala Africa also worked in close collaboration with the Jerusalem Centre of Urban Innovation, domiciled at the Hebrew University in Jerusalem, to ensure the indicators used were focused on inclusiveness and sustainability in ways that were achievable to African cities.

Data collection was done using both primary and secondary sources. For primary research, questionnaires were sent out to relevant ministries and individuals with knowledge on smart city initiatives in their respective cities or individuals with access to information. Secondary research was conducted to fill out incomplete questionnaires or weak responses that could not be verified. Some of the metrics within the index are available at the city level and some are only available at the country level.

Acknowledgements

We extend our heartfelt gratitude to the individuals and institutions who have played an instrumental role in the realization of the African Smart Cities Index. Your unwavering support, guidance, and expertise have been invaluable in this ambitious endeavor.

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Counsellor of Metaverse at the International Telecommunications Union (ITU)
Your visionary insights and commitment to the digital landscape have greatly enriched our understanding of smart cities in Africa. Your dedication to innovation and technology has been a driving force behind this initiative.

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Executive Director of the Jerusalem Centre of Urban Innovation
Your profound knowledge of urban innovation and your passion for advancing sustainable urban development have left an indelible mark on the African Smart Cities Index. Your collaboration has been instrumental in shaping our research and findings.

Mr. Bruno Lanvin
President of the Smart City Observatory at the International Institute for Management Development (IMD)
Your expertise in smart city governance and your leadership in the field of management have been invaluable assets to our project. Your commitment to excellence has inspired us to strive for the highest standards.

Mr. Calvin Chu Yee Ming
Managing Partner at Eden Strategy Institute
Your strategic insights and forward-thinking approach have added depth and relevance to our research. Your partnership has been pivotal in ensuring the practical applicability of the African Smart Cities Index.

High Level Scientific Advisory Board
We extend our sincere appreciation to the esteemed members of the High Level Scientific Advisory Board. Your collective wisdom and guidance have been the cornerstone of our research, ensuring its rigor and credibility. Your dedication to the advancement of knowledge is truly commendable.

To all those who have contributed to the African Smart Cities Index, whether directly or indirectly, we express our gratitude for your unwavering support. Together, we are paving the way for smarter, more sustainable, and inclusive cities across Africa.

Authors:

Dr. Rene Kabalisa (PhD)
Rwanda Information Society Authority (RISA)

Olufemi Johnson
Dala Africa