

## Pathways to Development of Nairobi Towards Gaining a Smart City Status

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### Introduction

Smart cities have become prominent in first world countries. Nairobi city has the necessary hard and soft infrastructure, which forms the basics of a smart city, yet it has not yet transitioned to smart city status. There is need to accelerate the city growth towards the attainment of smart city status. This is possible given that the country has one of the fastest Internet speeds in Africa, with 52.4% of city dwellers using the Internet. In addition, it has the highest mobile penetration rates in Africa at 75.0%. However, the major problem is the disconnect in different infrastructure networks within the city. In a smart city, the interconnection between different social, business, information technology, and physical infrastructure network is necessary to allow for data availability in real time and improve livability through the interconnection of healthcare, water, waste, traffic, and housing management systems, among others. The different departments within the city operate and collect data independently, making sharing of information between departments difficult.

Failure to have interconnection (a central monitoring system) between different systems hinders data availability in real time for use in handling inefficiencies to improve quality of life. It has led to increased urban problems such as the risk of air and environmental pollution, increased insecurity, traffic congestion, and slow disaster responses. The country loses Ksh 50 million daily in productivity, pollution, and fuel consumption as a result of traffic congestion. In addition, the city loses billions of shillings a day due to inefficiencies and, as such, it is imperative to invest in systems that can address challenges in the way of Nairobi becoming a smart city.

Nairobi City County is the single city that contributes the largest share of the country's Gross Domestic Product (GDP). For instance, in 2021, the county contributed 27.5% of GDP. Making Nairobi a smart city will allow for an inflow of talent and investments as a result of a higher happiness index and a safer environment. This will further lead to an increase in GDP contribution, hence improving the economy. To have a central system, the city needs to address the following fundamental issues.

### Factors Impeding Nairobi's Attainment of Smart City Status

It is critical that the leadership of Nairobi County prioritizes the development of the city into a smart city. Several factors prohibit the smooth transition. These are:

#### Unreliable power supply and Internet quality

Like other types of cities, energy is critical in a smart city as it facilitates communication between different systems. Kenya's energy production and distribution system need reforms to allow uninterrupted power supply. On average, Nairobi experiences 8 power interruptions per month, raising a serious issue on whether the power supply can support a central system for monitoring the city. Also, every outage takes an average of 5 hours.

The Internet quality in Kenya is ranked fifth in Africa. This ranking comprises affordability, stability, and e-infrastructure. Despite ranking among the best in Africa, the speed is 34% slower than the global average. Additionally, the country has a bandwidth capacity of 11,600 gigabytes. However, the connected bandwidth is only 3,000 gigabytes. It raises the question of what happens if the full potential is tapped. Therefore, the current Internet quality is unlikely to support the integration of many systems within a city together.

#### Outdated infrastructure and informal settlements

Infrastructure is a prerequisite for installing sensors, Closed Circuit Television (CCTV) cameras, among other soft systems for a smart city. Some of the infrastructure in Nairobi have depreciated, with limited maintenance and repair. It needs repair and continuous maintenance for the soft systems' installation. An example of such systems is the sewer lines and water systems, which frequently experience leakages.

One aspect of a smart city is smart living; Nairobi has 36% of its population living in slums. More decent housing fitted with the necessary infrastructure could be necessary to allow for the integration of the soft systems, which could enhance security and public safety in informal settlements.

#### Digitalization and automation of systems

Despite increased digitalization, some systems are still analogue and need to be upgraded. To have a smart city,

there is need to know the city first, which can be achieved through digitalization. After the records are digitalized, technologies can now be integrated to search, analyze and interpret the information. Digitalization could also help in tracking progress. For example, digitalizing the waste management system will help monitor and manage the different stakeholders and the volume of waste generated within the city daily (2,400 tonnes per day).

### Collaboration between private and public sectors

In Nairobi, private and public sectors operate in isolation to offer services to the residents. For a smart city to be effective, there should be collaboration between the private and the public sector in offering the services. For instance, a common system is needed to offer emergency response in case of fire. This could incorporate the city-county government and other private players such as the Red Cross. Also, actors in the security sector should work together to ensure we have a well-monitored city. This will facilitate the development of a common emergency response system that can be integrated with others to form a larger system. Additionally, the National Transport and Safety Authority (NTSA) should collaborate with government authorities responsible for maintaining Kenyan roads to ensure that once they notice an issue through the transport-integrated management system, they can work together and solve it.

### Policy Recommendations

In addition to improving the indicators that are of higher importance across all the dimensions, Nairobi city planners will also need to consider interconnecting, social, information technology (IT), physical and business infrastructure facilities within the city (waste, water, housing, traffic, among others) to allow for data availability in real time to monitor inefficiencies in service delivery and improve liveability. Specific recommendations follow:

#### People

- (i) Empowering human resource development through education and digital access to improve the people's dimension.
- (ii) Fast-track the progress with Digital Literacy Programme (DLP) through monitoring and evaluation to identify gaps and ensure seamless implementation of the programme to improve the people's dimension.

#### Living

- (iii) Strengthen the project of building additional health centres in the slum areas initiated, which will improve

the health infrastructure indicator. These hospitals need to be equipped with drugs, inpatient beds, and maternity facilities, among other pharmaceuticals. Also, the employment of additional health officers will see the number of available health officers increase.

#### Mobility

- (iv) Expand the ICT infrastructure by fast-tracking implementation of the National Broadband Strategy 2018-2023 to help in increasing the speed of Internet within the country, which is a prerequisite.
- (v) Fast-track the implementation of the Kenya National Digital Masterplan's flagship programmes anchored on four pillars: digital infrastructure; digital government services, product, and data management; digital skills; digital innovation, enterprise, and digital business to allow for increased digital technologies adoption.
- (vi) Increase the electric vehicle charging stations to encourage the importation of electric vehicles, and thus reduce the use of petrol and diesel-powered transport, which account for a quarter of greenhouse gas emissions globally, thus improving the mobility dimension.

#### Economy

- (vii) Create more tech hubs by developing and implementing policy and legal framework to allow more young people to innovate and start their entrepreneurial journey.
- (viii) Encourage public-private partnerships to enhance investment, create employment opportunities, to reduce unemployment rate.

#### Governance

- (ix) Encourage a transparent governance system with enabling technologies to promote e-voting to improve on voter turnout.

#### Environment

- (x) The Nairobi City County to fast-track the implementation of the Solid Waste Management Act of 2015 to help in improving the environment dimension, especially the waste aspect.
- (xi) Enhance waste recycling by developing and implementing a policy on waste recycling. Recycling waste will lead to energy conservation, reduce water, and air pollution, and reduce greenhouse gases.

### About KIPPRA Policy Briefs

KIPPRA Policy Briefs are aimed at a wide dissemination of the Institute's policy research findings. The findings are expected to stimulate discussion and also build capacity in the public policy making process in Kenya.

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