

The technology driving Africa's smart cities

 By [Riaan Graham](#)

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Around the world, cities are exploring how they can best make use of technology to improve the quality of life for their citizens, run public services more effectively and provide businesses with a springboard for growth. The various applications of smart city technology are numerous, from managing a city's waste or road networks to making citizens safer or improving sustainability.

It's time that we start to embrace that in Africa. We've already started, with deployments across Africa with the City of Tshwane and Western Cape in South Africa setting examples for municipalities across the country to follow. It's great to see that there is government level support too, with municipalities going digital in their efforts to boost service delivery.

The importance of taking advantage of the opportunities offered by smart city technology couldn't be more critical than it is now. According to a World Bank study, 70% of the world's cities outstrip their national gross domestic product, with 600 cities expected to account for 60% of global domestic product by 2050.



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What these figures highlight is that cities are operating within an increasingly competitive global marketplace, vying with one another to attract or foster the best talent and most productive businesses. Smart city technology can help them achieve this, but it all starts with a solid foundation.

Wi-Fi: the missing technology puzzle piece

However, knowing what technology to put in place can often be a barrier to development. Our own research* found that 76% of South African poll respondents said they believe that the lack of fibre infrastructure is the biggest tech barrier while 71% indicated funding as the biggest non-tech barrier to smart cities roll-out.

Cities are under more pressure than ever to support digital transformation efforts for the sake of businesses, the environment and their citizens. Cities have always existed as hubs of economic activity and when it comes to maintaining their pre-eminence in this respect, becoming 'smart' is no longer a nice to have. Everything from location-based services to smart public transport is becoming a contributing factor in the economic success of cities, and those that are not investing in such technology are already losing out.

Moreover, digital services are set to play a major role in reducing the economic impact of smart cities with things such as smart street lights, intelligent traffic management and smart buildings all set to significantly reduce energy consumption and emissions output. Not only will this be a major step forward for reducing a city's impact on the environment, but it is also set to improve the quality of lives for city residents, which in turn is likely to attract higher earners and with them more successful businesses, contributing further to economic success.

It's for this reason that, as cities pursue these various objectives, free public Wi-Fi has become a de facto requirement for building a smart city.

For a start, Wi-Fi is incredibly cost-efficient and easy to deploy, which makes it ideal for city planners and authorities who are looking to maximise their return on investment and who don't want to be stuck with protracted infrastructure works which risk being delayed by factors outside of their control.

Moreover, Wi-Fi is capable of delivering high bandwidth and, critically, offers near universal support across mobile devices.

Choosing the right model

As cities jostle for position with one another to offer the most effective services, and by extension the most robust Wi-Fi, there are obviously questions around how to fund the deployment.

Here, there are a number of options ranging from city-funded to public-private partnership or operator delivered. Naturally, the choice of model depends on the requirements of the solution. For example, an operator owned model, whereby the provider earns back their investment through means such as advertising, would likely be the most cost-effective model, but then may give a third-party operator first rights to what could become critical city infrastructure.



Conversely, a city-funded model is likely the most appropriate where the city authority is looking to operate critical services on the network as well as offering public internet access. However, this, of course, necessitates investment in management and maintenance of the network which brings with it a varying degree of cost. Sitting between the two you have public-private partnerships, which offer elements of both the city-funded and operator owned models and are increasingly common in the smart cities space.

Bridging the gap between city and citizens

The primary reason for deploying a city-wide Wi-Fi network is to connect people, whether residents or visitors, with the city and its services. Whilst many of us take internet access for granted, the reality is close to 90% of SA households don't have access to the Internet at home, while 61.8% have access to the Internet anywhere (work, place of study, internet cafes, friends, etc.). With the increasing digitalisation of public and private services, cities providing internet access as a public good ensure that no one under their care lives in internet poverty, enabling them to meaningfully participate in civil society.

Providing public Wi-Fi also benefits tourism. Today tourist expects to be connected at all times, wherever they are, and especially when tonight's dinner reservation depends on being able to search the web for the most highly recommended local spots [supplement with local case study if possible].

Going beyond the internet

The great advantage of building a city-wide Wi-Fi network is that once it's deployed, it provides a foundation for a multitude of use cases and has the capacity to accommodate future developments. For a start, location services built into the access points can provide city planners with rich footfall analytics, giving them insight that can help them more effectively deploy public resources, such as policing, and even inform city planning and development decisions.

Many of the more innovative smart city deployments rely increasingly on the Internet of Things. Initiatives such as Cosmo City near Kaya Sands, Johannesburg rely on sensors that operate across a number of different communications standards, whether that be ZigBee, Bluetooth Low Energy (BLE), LoRA or others.

The problem with this is that each new communications standard adds another layer of complexity, in turn increasing the

vulnerability of the deployment to being hacked.

Research carried out by Ruckus highlighted these concerns, with 86% of poll respondents* in South Africa citing security concerns as a critical factor to consider when deploying smart city initiatives. In tackling these security vulnerabilities and capitalising on existing Wi-Fi infrastructure, cities can create an IoT access network which rationalises multiple networks into one, simple to use and manage, converged network.

Benefits on every level

For those working to bring better services, quality of life, and opportunities to their citizens, smart cities are a game changer. Implementing city-wide Wi-Fi is the first step toward making them a reality.

The business case is clear, the citizen benefits are clear, but now we just need to make them a technological reality. The possibilities are limitless with advanced technology in smart lighting, traffic and parking systems, public safety and much more.

**Wi-Fi in South Africa 2018, Ruckus Networks and World Wide Worx*

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