

# Building Sustainable Smart and Resilient Cities for SA

This study looked at factors which influence city resilience and the role of smart city drivers

**W**ith new smart cities set to be on the cards for South Africa, what elements are needed to ensure that these technology-driven cities are resilient against future shocks and threats such as floods and pandemics and can cope with present and future requirements of residents?

Using a questionnaire survey, [research](#) from the DSI-NRF SARCHI Research Chair in Sustainable Construction Management and Leadership in the Built Environment at the University of Johannesburg, targeted construction professionals with adequate knowledge about smart cities and resilience in cities to appraise the influence of primary factors - climate change, education, food security, public safety and threat of disease - to the resilience level of a city, as well as the role of smart city drivers in building resilience cities.

With a focus on the three main municipalities of Gauteng, namely City of Ekurhuleni, City of Johannesburg, and City of Tshwane, the study found that all the primary factors surveyed influence the resilience level of a city. However, climate change, together with education and food security, are major factors to take into consideration if resilience in South African cities is to be achieved.

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## Influence of education on resilience

The resilience level a city adopts is directly dependent on the knowledge capacity of its residents. Thus, skills and knowledge development must be implemented so that learning and the education level of residents can be improved through the use of equipment that is technology savvy. Such equipment can be installed in higher institutions, schools, and public centres to build technical and literacy skills.

## Influence of climate change on resilience

Green infrastructure development and energy conservation are major factors influencing the resilience of an urban city. This is because the environment plays a major role in the wellbeing of residents. Therefore, the adoption of green infrastructures within South Africa will lead to reduced levels of pollution while climate change effects will be minimised. In addition, trade-offs among the various sectors can be used to maintain energy consumption standards as well as the adoption of eco-mobility strategies such as electric cars to help to reduce energy emission and consumption.

## Influence of food security on resilience

Agricultural land regeneration initiatives can promote the resilience level of a city. This is because growing the urban



agricultural sub-systems will help to support an increase in local food production, thereby creating empowerment for entrepreneurs in the agricultural sector. This is also expected to improve and facilitate the cities' ability to extend local products and also launch a solid collaboration between local produce suppliers and food marketers.

## Drivers of resilient smart cities development

The development of a smart economy, followed by smart living and smart governance can drive the resilience of a city. According to the study, the smartness of an economy will ensure that essential resources required to make a city resilient are available, and smart living will promote individual safety and betterment of society through the use of technology devices such as surveillance cameras. Furthermore,

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having transparent government that has sound political strategies and considers its citizens' viewpoints in decision making will ensure that the interest of residents are well preserved.

Even though resilience can be achieved by making cities smart, smartness does not bring resilience by default. Thus, the study recommends that all the relevant stakeholders, as well as the city residents, should

focus on ensuring that cities are made smart. This can be achieved by the construction of smart infrastructure and upgrading the "smartisation" of existing infrastructure to meet the required standard. In addition, smart city drivers have the potential to mitigate the challenge of unemployment by promoting the empowerment of entrepreneurs and facilitating a thriving informal economic sector. 