Transitioning Urban Infrastructure for Smart Cities

South Africa needs a holistic framework if it is to meet the challenge of transitioning the traditional urban infrastructure of its cities to the "smart" level.

Viewing cities from a systems perspective is necessary to investigate and understand cities and their transitions

The smart sustainable city concept has become the new urban development ideal. A smart city can be defined as one that meets the needs of its current population; avoids negatively impacting the ability of future generations to meet their needs (sustainability); and which incorporates information and communications technology (ICT) to address issues of efficiency, autonomy and real-time data capture. A project carried out by researchers from Stellenbosch University and the Victoria University of Wellington undertook a literature review with the objective of developing a holistic framework for transitioning urban infrastructure to meet the requirements for smart sustainable cities.

Viewing cities from a systems perspective, i.e. observing cities as adaptive "systems within systems" due to their complexity, population, diversity, autonomy, and emergent change is necessary in order to investigate and understand cities and their transitions.

City infrastructure is also the intervention point for sustainable urban development. Infrastructure networks, which include, but are not limited to, ICT, form the "new skeleton" for the co-evolution of social and environmental systems and serve as a critical support system to society. Proper planning and strategic management enable infrastructure (including critical infrastructure such as energy, mobility, food, water, finance and ICT) to act as an enabler for societal and economic growth and environmental management. Without them, cities experience inequality and resource depletion and can, on a larger scale, affect global economies, climate and security. The interdependence of these networks means that a failure in one area can have a knock-on effect in other areas.

What the researchers found was a dearth of literature; a fragmented body of knowledge; and an absence of frameworks to guide city-level planning, implementation and management of smart sustainable city transitions. What is needed is a holistic and comprehensive guide that can facilitate the move towards smart city status. This is a future objective of the research team. **SM**