



5 YEARS FORWARD: GCC SMART CITY SOLUTIONS

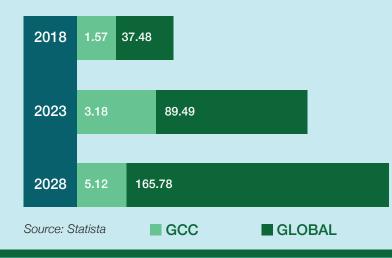
AN EXCLUSIVE REPORT FOR THE WORLD FUTURE ENERGY SUMMIT BY FROST $\dot{\mathcal{O}}$ SULLIVAN

By the **end of 2028**, the number, size and scale of GCC smart cities will be greatly accelerated, based on the rapid development of key technologies and solutions that are bringing the dream of true **smart city living** to life.

What exactly is driving the growth of smart cities in the GCC?

Where are the new opportunities and growth drivers? And what, if anything, might stop or slow the rise of this revolutionary type of urban environment?

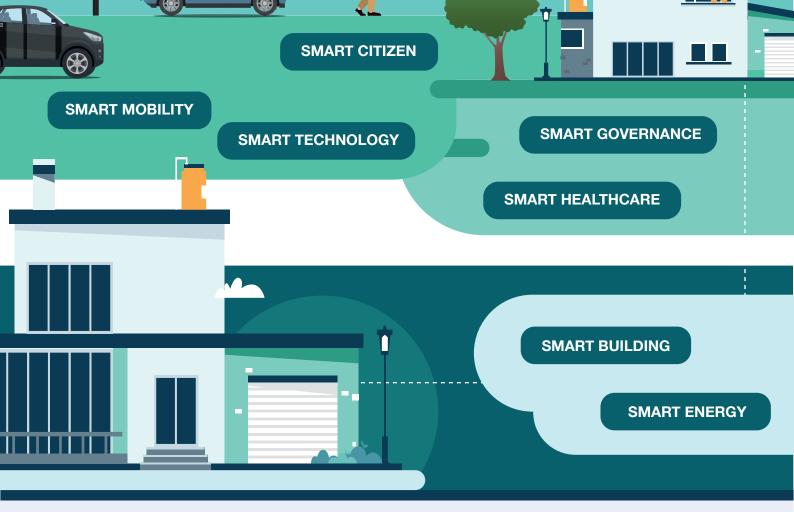
SMART CITY SOLUTION INDUSTRY SIZE (BN) AT A GLANCE



SMART INFRASTRUCTURE

SMART CITIES: INNOVATION MEETS URBAN LIVING

From the buildings, transport routes and green spaces, to the way citizens access utilities and healthcare, every smart city solution needs to be integrated into one holistically overseen and operated whole.



WHAT **ELEMENTS** ARE NEEDED TO MAKE A CITY TRULY **SMART?**

Communication Network Infrastructure

Big data platform and cloud storage for centralized data Real-time command and control center with business intelligence capabilities

Cybersecurity and data protection mechanisms for city networks and applications

WHAT LAYERS ARE INVOLVED?



TECHNOLOGY

Hardware and software for cloud monitoring, AI, city mapping, Big Data analytics, vehicle-to-everything (V2X) and the GPS system.



REGULATORY

License, permits, taxes, vehicle policies, city regulations, incentives city initiatives and targets for emissions and congestion.



TRANSPORT

Public transport, shared mobility, freight and logistics.



INFRASTRUCTURE

City infrastructure (traffic lights, parking areas, streetlights), utility companies and technology infrastructure (API's, data center, network infrastructure).





WHAT WILL **SLOW OR SPEED** UP GCC SMART CITY **GROWTH?**

SMART CITY SOLUTIONS **DURATION IN YEARS** KEY GROWTH DRIVERS (2023-2035) 1 - 2 3 - 4 5 - 14 Investments in telecommunication networks (5G standards) and high smartphone penetration will drive growth in digitising HIGH HIGH HIGH city infrastructure and services. The advancement in the sensor industry - the miniaturisation of technology (smaller, cheaper, simpler, and low-power HIGH HIGH HIGH consumption) to connect more objects to a smart city network. Public and government funding that will aid smart city programmes aimed at increasing the efficiency of city utilities, MEDIUM public safety and improving the quality of life. Increasing the automation of administrative tasks such as MEDIUM MEDIUM MEDIUM reducing the manpower necessary for the operational management of the city. Private participation and investment which will create new services and delivery models that sit on MEDIUM MEDIUM top of smart city platforms. SMART CITY SOLUTIONS **DURATION IN YEARS KEY GROWTH RESTRAINTS (2023-2035)** 1 - 2 3 - 4 5 - 14 Cost Installing a comprehensive smart city solution is prohibitive for HIGH smaller urban areas and cities in developing economies. Data privacy concerns These will need to be addressed at a faster pace. Digitisation Digitising all public utility services, risks marginalising the poorest HIGH HIGH or technologically challenged sections of society.

WHERE WILL GCC CITIES NEED TO FOCUS?



Autonomous Mobility The operation of autonomous vehicles in cities will require investment in the digital mapping of cities and the digitisation of city infrastructure, such as



IoT-enabled Smart Buildings Accelerate **investments** in the **IoT, AI, Artificial Reality and Virtual Reality**, and focus on using AI and Machine Learning (ML) to gain data and insights on building performance. This will create digitally connected and futuristic cognitive (responsive and

flow analytics and solutions that include vehicle-to-infrastructure and vehicle-to-vehicle communication devices.

traffic lights and parking spaces, crowd

Future City Planning

As cities continue to digitise their physical infrastructure and data to be collected, stored and analysed, the next step in the evolution of smart cities would be to use the data to create **digital twins**, a virtual three-dimensional (3D) construction of a real city.



Smart Infrastructure

Develop a low-cost solution comprising cost-efficient sensors, sensors that work in basic and old infrastructure, and sensors and connectivity solutions for hotter and colder climates can drive growth, especially in developing economies and cities that experience harsh climates. intelligent) buildings.



Circular Economy and Sustainability

The increased global emphasis on **clean and efficient energy usage**, with the default adoption of **reusing**, **recycling**, **and repurposing** within the built environment, will provide an edge to those solution providers who are first to rethink and redevelop their products and services, supply chains and value propositions, with a renewed focus on a sustainable and a **circular economy future**.

New Business Models

The continued **integration of technology and digitalisation** into products and services offered, will fuel the need to further create **technology-enabled and circular business models**, that are more focused on outcome and value creation, while shifting away from products to services (XaaS) in smart cities (e.g., Software-as-a-Service, Digital

Transformation-as-a-Service, Pandemic Response-as-a-Service, Air Quality-as-a-Service or Healthy Building Benchmarking-as-a-Service).



WHAT'S NEXT FOR GCC SMART CITIES?

Global urbanisation, with all its emergent needs and current shortcomings, make the development of smart cities a necessity, not a choice. GCC smart cities will keep evolving, with a particular focus on being wholly sustainable to counter the acute climate risks and public health factors the region faces.

Genuine smart city planning, delivered while engaging with communities and carrying out diligent monitoring and continuous improvement, will allow GCC cities to become truly sustainable, while unlocking the full potential of the integrated solutions that underpin their development.

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