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In New York and across the U.S., the age of the smart city is now - by Robert Bianco

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Recently, a major American newspaper with a worldwide readership published an opinion piece about smart city infrastructure written by a professor of civil engineering.

In short, the engineer's perspective was that smart cities will be expensive, "exceedingly complex to manage," and that for many urban challenges, from waste management to transportation, effective analog or "dumb" solutions already exist. Moreover, the author likened many smart technology solutions to a Rube Goldberg machine — fun, but unnecessarily complicated. While the author allowed that technology has a place in cities, he also opined "that place is not everywhere."

With all due respect to the professor and the esteemed publication, nothing could be further from reality.

The fact is that smart city technology has already transformed the services and infrastructure of many urban environments, from New York, Pittsburgh, and Los Angeles, to unexpected locales such as Boise, Idaho, and Columbus, Ohio. And while we usually associate smart technology with futuristic initiatives in large Tier I metropolises, a recent survey by the analytics and consulting firm IHS Markit and the U.S. Conference of Mayors found that, "Smaller cities tend to focus on smart city projects that deliver a clear, tangible return on investment, such as smart street lighting or resource management, rather than more experimental projects."

Take Schenectady, N.Y., a city with a population of only 66,000, for example. By integrating a Wi-Fi network, environmental sensors and sustainable smart LED lighting technology throughout the city's downtown, officials are now able to conserve natural resources, gain access to information regarding traffic overflow and pavement conditions, and by augmenting its existing network of video surveillance cameras, enhance public safety while providing police officers with real-time face-to-face communications capabilities. City residents can also access the video feeds from their smartphones or home computers.

Meanwhile, in New York City, currently operating smart initiatives include smart water quality

sensors and meters, smart traffic management, smart waste compactors, and, developed in partnership with Microsoft, the Domain Awareness System, a smart law enforcement program that has become so successful in reducing crime levels that it is now marketed to city governments around the globe.

A Densely Layered Ecosystem of Technologies and Providers

In cities across the U.S. the increasing proliferation of the Internet of Things (IoT), the network of sensors and other intelligent devices that are embedded in homes, buildings, public spaces, and infrastructure, and which are connected to centralized computer systems, has accelerated the speed and scale of information-gathering. Municipal governments have put sensors in streetlights to monitor and control traffic. Sensors deployed on buses now alert transportation officials about congested intersections. And strategically placed electronics are used detect gunshots, monitor noise and air quality.

It's IoT technology, and very soon 5G wireless networks as they move from their initial roll outs to mainstream adoption, that will drive smart city applications and systems. In addition, the cloud, edge computing, and colocation facilities, especially those located in or within close proximity to major metro areas, will all play significant roles in support of various smart city projects. For the developing smart city such as New York, 5G's capacity to connect 2.5 million devices per square mile will become critical to serving a densely populated urban environment. That said, to maximize the full potential of 5G wireless will require increased deployments of both macrocell and small cell technologies.

Small cell installations, unlike traditional macrocell towers that have a coverage area that spans several miles in each direction, typically serve a much smaller geographic area measured in hundreds of feet. The antennas are also much smaller than those deployed at macrocell sites, and typically are attached to buildings, rooftops and structures in public rights-of way, including utility and light poles, on street furniture, or on other public or private property. And because smart city applications require robust data connectivity, advanced fiber-optic networks will also be required to serve the increasing number of wireless endpoints that 5G small cells will create, and at the necessary transport bandwidth these new technologies will demand.

Smart cities aren't so much comprised of siloed killer apps as they are a densely layered ecosystem in which a number of technologies will interact, exchange information and deliver actionable intelligence for informed decision-making. The long-term goal of any smart city, whether it be the Big Apple, Phoenix, Sacramento, or Baton Rouge, is to create safer, healthier and more sustainable urban environments. And to accomplish this task will require not just telecommunications providers, but also electrical infrastructure, engineering and construction firms all pulling together and integrating their services towards this common cause whose time is now.

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