5G for smart cities

A guide to more efficient and sustainable operations

5G

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Build smarter communities with 5G technology.

5G Ultra Wideband is fast. We're talking really, really fast. But it brings so much more to the table than just speed. Like lower latency. Higher bandwidth.

And exciting new opportunities for communities to innovate efficiently.

This guide will take you on a deep dive into 5G and how — building on the foundation of 4G LTE — it should open the floodgates for smart community solutions with the promise to improve operations, sustainability and livability.
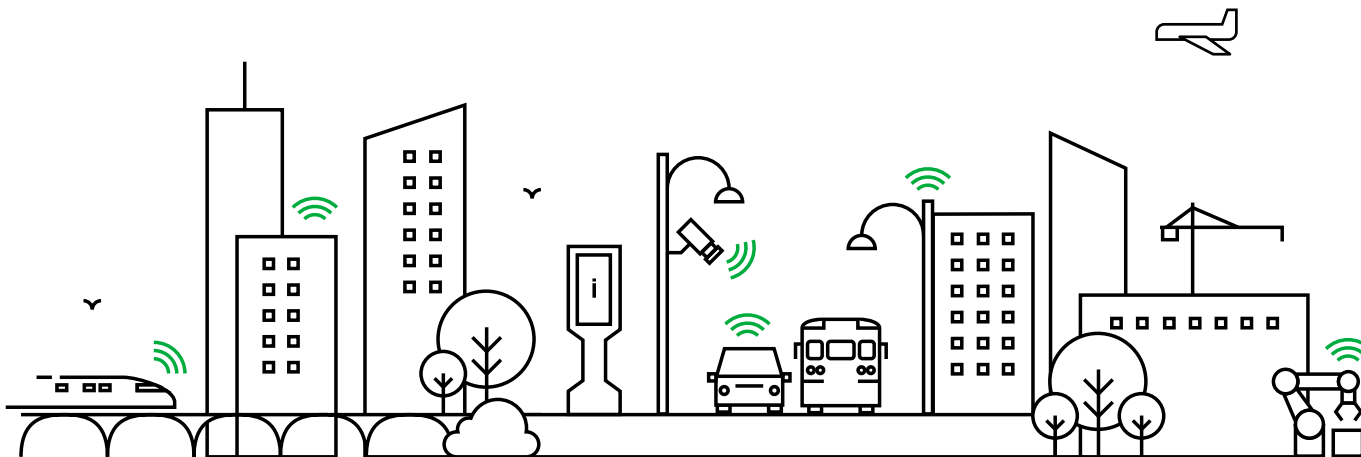
Paving the way to a sustainable future

Cities are already home to more than half of the world's people and an estimated 3 million more move into cities every week. And that's putting a major strain on infrastructure, natural resources and budgets. At the same time, hyperconnected urban residents are demanding increasingly sophisticated services.

It's no wonder that many city leaders are turning to smart city solutions to help them deliver services more efficiently, effectively and sustainably.

Smart solutions to big challenges

Smart city solutions are designed to help communities, sports venues, college campuses and corporate facilities:

- Increase efficiency, safety and resilience
- Improve quality of life
- Boost public engagement
- Support sustainability initiatives

They include technologies such as intelligent lighting to help conserve energy and improve visibility. Traffic analytics and monitoring keep vehicles moving and passengers, pedestrians and cyclists safer. And traffic-violation detectors, variable toll pricing and smart parking can help communities create or refresh revenue streams.

It's all about designing infrastructure, systems and processes that empower communities to provide services in new, cost-effective ways.

And building on the foundation of 4G LTE, 5G could help cities do even more.
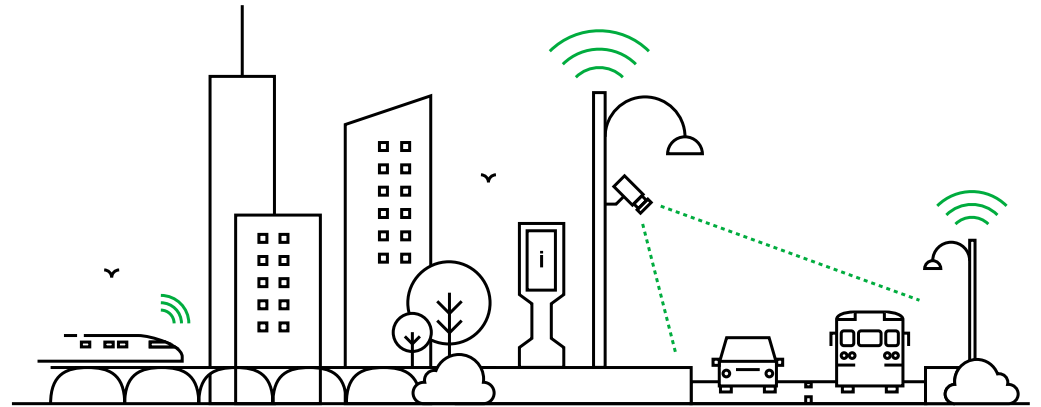
Built to support the needs of government

5G is the fifth generation of cellular mobile communications. It will provide data transfer rates many times faster than the blink of an eye. 5G will also accommodate a huge increase in connected devices and data demands, and empower faster, more localized processing.

5G was built to support the needs of government agencies and businesses, as well as consumers. It is expected to enable capabilities such as 4K video and near real-time analytics. Imagine going from a two-lane road to a 10-lane highway — that's the level of change we're talking about.

> **5G will also create exciting new opportunities for communities to innovate — especially in combination with other technologies, like edge computing and the Massive Internet of Things (MIoT). These leading-edge technologies will open the floodgates for new smart-community solutions while enhancing existing ones.**

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Why 5G and MEC?

Edge computing is a form of hybrid cloud that brings compute resources and infrastructure closer to the end user and where the data is generated.

Verizon Multi-access Edge Computing (MEC) is ideally structured for leveraging different types of mobile networks — including 5G — to provide consistent, resilient and secure connectivity.

MEC, combined with 5G, could deliver the ultralow latency and ultrafast processing speeds that enable near real-time operations. Like almost-instantaneous public safety response. As-it-happens traffic management. Up-to-the-moment transit information. And so much more.

Why 5G and MIoT?

Smart communities are all about connections. And 5G is expected to be the ultimate connector, capable of supporting up to 1 million devices, all sending and receiving data, in less than half a square mile.

5G's unprecedented capacity is expected to spur a radical increase in the number of connected devices and systems, leading to the creation of the MIoT.

That's a huge opportunity for communities to create more connections. With streetlights, traffic signals, surveillance cameras, sensors, meters, vehicles, drones, smartphones and other endpoints. Connections that deliver huge amounts of relevant data that — by utilizing MEC-enabled technologies like artificial intelligence and machine learning — can be made actionable almost instantaneously.

What could 5G bring to your city?

Verizon 5G Ultra Wideband has the potential to open the door to new ways of capturing, processing and relaying data to create safer, more livable and sustainable communities.

At the Verizon 5G Labs, innovators, startups and entrepreneurs are exploring the power and possibilities of 5G technology as they help grow use cases. We have a number of smart community/public safety solutions in the works, including platforms that:

- Capture, analyze and distribute video content in real time
- Provide hyperaccurate area mapping to aid with delivery services and emergency response
- Remotely control miniature robots that may aid in disaster response
- Aggregate information from deployed personnel, autonomous agents, information services, and body-attached or unattended ground sensors to deliver a broad array of information
- Use augmented reality (AR) and computer vision to help enable faster, safer navigation through smoke-filled rooms while transmitting visual point of view, telemetry data and location to command and control

And this is just the beginning. 5G, with its ultrafast speeds, ultralow latency and massive capacity, has the potential to revolutionize the way cities deliver services and interact with residents and businesses.

An opportunity for collaboration

5G opens the door for community leaders to collaborate with providers and participate in early stage planning and development to determine the services that will most benefit their community.

Keep in mind that 5G will be phased in gradually and it's designed to seamlessly operate with 4G LTE Advanced to help protect and future-proof your investments.

As with any major technology evolution, the better—and sooner—you prepare for 5G, the smoother the transition will go. And the quicker you'll be able to take advantage of the benefits it could bring.

Following are some tips for getting started:

🔍 Assess and baseline your environment, so you can develop an executable transformation plan.

◎ Select the right network partner to help you identify the processes and applications that would most benefit from real-time responsiveness or ultralow latency.

⚙ Begin transitioning from traditional operating environments to programmable, on-demand, software-defined ones.

⧉ Implement 4G LTE smart community technologies now, to streamline the transition (see section 8).

👥 Collaborate with your network partner to create pilot projects to assess the potential value of 5G-enabled technologies.

Smart solutions you can implement now

The following are brief descriptions of our current Smart Communities solutions for traffic, public safety and energy management. While these solutions exist today, those that collect, process and distribute data are expected to become even faster and more powerful with the Verizon 5G Ultra Wideband network.

Grid Wide Utility Solutions
Modernize grid infrastructure to drive incremental revenue while controlling operating costs and increasing efficiency.

Intelligent Lighting
Helps you control costs and save energy. These solutions and the network use smart technology in a city's streetlights to regulate light levels.

Intelligent Video
Utilizes edge analytics to provide real-time monitoring of remote property and assets.

Parking Optimization
Uses computer vision analytics to provide actionable insights to help you better understand parking patterns and pain points, optimize revenue, and create better parking experiences.

Real Time Response System
Integrates and compiles data from multiple sources of public safety information, such as computer-aided dispatch, video sensors, record management systems and third-party databases, to provide a consolidated, accurate and real-time view of the vicinity.

Virtual Contact Center for Government
A high-performance contact center that enables multichannel communications with constituents, individual recognition for accurate routing and tailored responses to help increase first-call resolution. It includes omnichannel routing, interactive voice response (IVR) and advanced chat, an agent interface, and real-time dashboards and reporting.

Traffic Data Services
Delivers near real-time insights and historical analysis about traffic flow, based on anonymized cellular data, to help planners minimize congestion, plan future multimodal transportation and improve land use.

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Your partner for 5G transformation

Verizon appreciates the challenging work government leaders perform every day. We welcome the opportunity to help you navigate regulations, policies, procurement processes, reporting requirements and other complexities within this ecosystem.

We also embrace solutions that explore pilot programs, public/private partnerships, grants and other innovative ways of making smart community programs a reality.

You can start your 5G transformation today by contacting your Verizon Public Sector Business Development Manager.

The right network for smart communities

Verizon is continually enhancing our network output and capabilities to enable voice and data interoperability across agencies, jurisdictions, devices and networks.

And with nine global Security Operations Centers analyzing billions of events, Verizon is a world leader in the security space, demonstrating scale to proactively manage global threat vectors across cyber, identity, physical and digital. From implementation to compliance, Verizon protects your operations, including rigorous device certification and hardware security, so you can stay focused on serving your constituents.

With Verizon, you get the coverage you need, on the network you can trust. With Verizon, you're ready.

(Learn more about Smart Communities)   (Learn more about 5G)   (See our full list of 5G cities)

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1 https://www.cnbc.com/2018/05/17/two-thirds-of-global-population-will-live-in-cities-by-2050-un-says.html
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