CORNING    CoreSite

# TOMORROW'S CITIES, TODAY'S TECHNOLOGY
## CORESITE'S SOLUTION

*Why coordinating fiber networks and scalable data centers is essential to creating an intelligent approach to smart city building.*

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## SMART CITIES SOLUTION **AT A GLANCE**

### CHALLENGE

- Enabling seamless flow of data from millions of end points and devices

- Creating an intelligent, efficient interconnected network for transporting data from one location to another

- Building a resilient, redundant, and highly available information network to keep all services and applications online.

### SOLUTION

- Build a high-performance, low-latency network mesh around hyper-connected data centers to combine on-premise and cloud-based computing power, along with 4G and 5G network connectivity.

### RESULTS

- Unites a diverse array of network, cloud, and service providers

- Optimizes data flow through advanced network peering

- Creates faster, more direct data flow, with fewer network hops

- Enables faster, more reliable delivery of essential citizen services

- Scales with transmission speeds to grow with local demands

**SMART CITIES**
Use Case

# A CONNECTED COMMUNITY



*"Cities and towns are already embracing the potential of tech-enabled living with things like smart parking systems, free public wifi and interactive city maps, and intelligent lighting that changes with external environments."*

*Marlana Bosley, Data Center Market Intelligence Lead, Corning Optical Communications*

## THE CHALLENGE

### The future starts now

From flying autonomous cars and robot police forces to on-demand 3D printed food and sentient artificial intelligence, the future could look a whole lot different from today.

While Hollywood's futuristic concepts are generations away — if they ever come— cities worldwide have already begun shifting their efforts to building more achievable and realistic "smart cities." These innovative urban centers are designed with efficiency, safety, and sustainability in mind and will leverage both emerging and existing technologies to push the envelope of what's possible.

*"The smart cities of tomorrow will rely on connected devices, artificial intelligence, and enormous volumes of data to transform every aspect of our lives transportation, healthcare, and even the concept of office buildings,"* says Marlana Bosley, Data Center Market Intelligence Lead at Corning Optical Communications, a leading manufacturer of fiber optic communications system solutions for voice, data and video network applications worldwide. *"However, all of that will require having the right infrastructure backbone in place, which is why it's so important to focus on laying the foundation for tomorrow's cities today."*

### Fiber as the fabric of society's future

The global population continues to grow at an average annual rate of 1.1%, adding more than 80 million new inhabitants every year. Research suggests that by 2050, more than two-thirds of the world's population will live in cities, creating a host of new challenges for governments and businesses to support such density and growth.

In response, community and political leaders alike are pushing a new vision of what life in both dense urban centers and smaller towns will be like in the coming years and decades down the road. They're imaging cities where:

- Everyday devices and services are connected
- Smart cars send and receive information to cut down on congestion
- Water and precious resources are consumed more efficiently and sustainably

Every aspect of tomorrow's interconnected cities becoming a reality depends solely on its ability to produce, analyze, and process portions of the estimated 44 zettabytes of data created worldwide every day. Because of this influx of data, it can be a strategic advantage to combine local area networks, power, and cellular into one fiber-based backbone for the smart buildings in these cities and high-density cabling solutions in the data centers to process all this new data.

*"Fiber is the most reliable network available and is the entry-level requirement for any smart city initiative,"* says Ben Green, VP Sales, Network, Channel and Enterprise Central Region at CoreSite. *"But those networks need someplace to meet and connect to make sure that data can be quickly, efficiently and reliably delivered where and when it's needed. And that's where the data center comes into play as a great enabler of smart city plans."* And the best approach for delivering these data rates will be by transmitting at lower rates over many fibers while building faster and staying under budget.

## THE SOLUTION

### Data centers: the brains behind smart technologies

In a world where everyone and everything is connected, speed and reliability are everything. It's not enough to have an extensive network of fiber cables traversing the city and surrounding areas; the entire system must be fast, stable, secure, and adaptable. Data centers will comprise the brain to a fiber network's nervous system, offering a central gathering place for connections from every corner of the connected city.

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*Corning Optical Communications*

*Since ushering in the telecommunications revolution with the invention of low-loss optical fiber in 1970, Corning has been continually innovating to increase the speed and capacity of optical networks, while reducing installation costs. Today, we are delivering optical communications solutions for growing segments like fiber to the home, wireless technology, and hyper-scale data centers.*

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**Ben Green, VP Sales, Network, Channel and Enterprise Central Region at CoreSite**

"As presently constructed — and even as planned — most cities' infrastructure won't have the bandwidth to deliver the massive volumes of data connected devices, and people will produce," Green says. "Nor will it have the performance required for latency-sensitive applications like autonomous vehicles or smart medical devices, which demand instantaneous data exchange and processing."

However, a new generation of hyperconnected data centers in dense city locations will combine on-premise and cloud-based computing power, along with 4G and 5G network connectivity into a single location. This will bring core infrastructure physically closer to end-users and devices, dramatically shortening data trip time, reducing latency and improving overall performance by:

- Uniting a mesh of different network, cloud, and service providers
- Optimizing data flow through advanced network peering
- Creating faster, more direct data flow, with fewer network hops
- Increasing the number of available paths to improve routing, efficiency and fault tolerance
- Utilizing 2- or 8-fiber connectivity solutions as transmission speeds scale from 4G to 400G

The additional fault tolerance and available data routes are essential to addressing two fundamental challenges facing future smart cities: uptime and security. Green says that redundant networks and a resilient ecosystem are imperative for safely maintaining connected services in case of an outage while also bolstering data security measures through digital and physical security barriers.

*"A city driven by data delivery absolutely must have an ecosystem that's available virtually 100% of the time because any service degradation or interruption will have a ripple effect across systems and users which can have severe consequences," Green says. "The same is true with network and information security, where a data center's physical security will deter tampering, and software-defined security protocols protect networks from digital intrusions that could wreak havoc."*

## CITIZEN SERVICES AND COMMUNITY BENEFITS

### Step by step into the future

To some, the potential for smart cities is still a pie-in-the-sky fantasy. Still, Bosely notes that cities around the world are already combining IT resources with internet-enabled devices to improve everything from patient-doctor interactions to gas and fuel line safety.

*"Cities and towns are already embracing the potential of tech-enabled living with things like smart parking systems, free public wifi and interactive city maps, and intelligent lighting that changes with external environments,"* she says. *"Others are beginning to take things even further, using smart technologies to analyze digital patient medical records for better preventive medicine, predict and prevent gas or water line explosions, and optimize supply chains devastated by the COVID pandemic."*

As city populations continue to swell from urban migration and suburban sprawl, local and regional governments will face even greater challenges in serving evolving public needs spanning everything from enhanced natural resource conservation to changing public safety requirements. The technologies of the future — connected, integrated, and data-driven systems — will command far greater capacity, agility and scale than the traditional infrastructure can deliver.

*"The life-changing potential of tomorrow's smart cities will only be possible if we take the right steps for laying the physical and conceptual groundwork today,"* Green concludes. *"The first and most crucial of those steps is arriving at a realistic understanding of the role that data centers will play as the heart and soul of that future, including a strategic build-out in the right locations and in the right order to enable all of the other innovative world-shaping solutions to follow."*