

Smart cities live on the edge



Think of a city as a complex system where many parts create a constantly evolving whole.

If you can gather data from those parts you can glean insights to guide the constant evolution of the city for the good of all its citizens. That's the idea of the "smart cities" movement. And it's gaining momentum.

Challenge: Architecting and paying for a new way of life

If the basic idea of smart cities is relatively clear, the underlying architectural challenges are just coming into focus. It starts with a massive deployment of the Internet of Things (IoT). These IoT resources will constantly – as in every single day – collect a staggering amount of data measuring traffic flows, temperature variations, public transit information, energy consumption and a host of other metrics across a metropolitan area. In many cases, this data will be produced in bursts rather than a constant trickle.

Analyzing that much data can be done in the cloud. However, transmitting that much data to the cloud each day is a major expense.

The promise of a smart city is then realized as efficiency and quality of life improvements are deployed after the cloud-based analytics. Many such improvements will involve managing items

that operate in real time, ranging from traffic flows to emergency response to such simple things as watering parks and green spaces. Controlling an entire city from a cloud data center that is likely hundreds, if not thousands, of miles away introduces latency that could prove unworkable for real-time civic management.

The smart city has many thousands – if not millions – of new endpoints.

Security is another potential issue. IoT modules may or may not possess the processing capability to run their own security services. Security for this massive IoT deployment must be built into the network.

Solution: An Acquire, Analyze, Act framework across the metropolis

Processing data efficiently for asset-intensive or interaction-intensive use cases across technologies requires smart solutions that increase availability of applications and workloads. Lumen® Edge Computing Solutions can help state and local governments achieve this by providing an environment on-premises and in the metro with edge computing locations where digital interactions occur.

Lumen can link IoT devices to cloud and edge computing resources that enable cities to acquire, analyze and act on the massive amounts of data collected by these devices. It can be done cost-effectively, securely and with low latency.

Lumen Edge Computing Solutions attack the challenges of latency, economics, regulatory, and autonomy to support initiatives for autonomous vehicles, parking, lighting infrastructure and roadway maintenance. Lumen® Storage solutions for the edge with Network Storage and Layer-2 Ethernet connectivity enhanced by Data Access Accelerator and Layer-3 IP-VPN provides enterprise grade storage at the metro level. These data “base camps” capture data from IoT devices and other sources that produce a lot of data, especially those cases where data is not being consistently acquired. Lumen offers flexibility and reliability so once data is stored in the network, it can be leveraged in numerous ways to create further value. In some cases, these base camps can apply processing algorithms that filter out background or irrelevant data to optimize any data flow that progresses to cloud-based analytics engines and reduce the cost of that data transmission.

Securing applications running at the edge and protecting its data requires security that is built-in and automated. With our robust Web Application Firewalls (WAF), Bot Management and API Protection service – as well as one of the largest DDoS deployments in the world – our vision for Lumen security at the edge is that it’s seamless, built-in, automated and informed by high fidelity threat intelligence to help protect and accelerate application experiences for our customers and their end users.

Results: Security and data flexibility

These architectures composed of Lumen Intelligent Solution components, expertise and managed services can modernize networks and secure workloads at the edge. Consider just a few effects of this edge computing infrastructure for smart cities:

- Reduced latency for control applications and security response
- Edge-based security for sensitive data
- Lower network costs from transporting only relevant data to the cloud
- Improved local control and reporting from local edge computing resources

Edge computing approaches put data processing and storage closer to the network edge where action takes place.

Visit [Lumen](#) today for more information or contact a Lumen Expert for consultation to get started.

Edge computing complements both cloud computing and the IoT, creating seamless, low latency and secure solutions.

lumen.com/public-sector

lumen.com/public-sector