



## A N A L Y S T   C O N N E C T I O N



**Alison Brooks, PhD., PMP**  
Public Sector Research Director

# The Importance of the Internet of Things for Communities

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*The Internet of Things (IoT) stands to fundamentally transform public sector service delivery in the following ways: first, by delivering smart government services where and when the citizen wants them; second, by enhancing public safety; third, by allowing increasingly resource-strapped government agencies to identify and manage operational cost savings; and lastly, by addressing social and environmental returns.*

The following questions were posed by Cisco to Dr. Alison Brooks, research director, on behalf of Cisco's customers.

**Q. What is the Internet of Things?**

- A. IDC defines the Internet of Things as "a network of networks of uniquely identifiable endpoints (or things) that communicate without human interaction (by either wired or wireless access) using IP connectivity — whether locally or globally." The IoT is innately analytical and integrated, reliant on the intersection of devices, intelligent system management, connectivity, platforms, analytics, and applications.

**Q. Why is the IoT important for governments?**

- A. The burgeoning device ecosystem (inclusive of both intelligent devices with embedded analytics and IP-enabled devices that merely transmit information) provides government organizations with new, better, and more granular real-time information. While this has its obvious merits, the burning question is: To what end does it fundamentally help government service delivery? Four key areas are enhanced citizen service delivery and safety; evidence-based planning, operations, and service delivery; cost savings and revenue growth; and social and environmental returns.

- **Enhanced citizen service delivery and safety.** Research shows that re-electability is most strongly correlated with the level of satisfaction a citizen has with his/her most recent government service experience. While this finding is not necessarily new, never before has it been easier to address a citizen's daily challenges and irritants. In a former time, an enterprising local government might set up a toll-free "pothole patrol" number. Today, this same goal is achieved much more elegantly and efficiently through IoT-enabled applications like Street Bump, a smartphone-enabled application that voluntarily crowdsources road condition data through a citizen's smartphone, helping improve neighborhood streets and plan for longer-term investments. Street Bump has been implemented in North America, EMEA, Asia/Pacific, and South America.

The implementation of "ShotSpotter" in New York City allows police across the city's major boroughs to locate the source of a gunshot immediately, reducing the potential for the proliferation of violence and shortening response times. In the latest deployment, 300 sensors spread over 15 square miles allow officers to pinpoint the shot location within 25 meters; the application can also determine the direction of the shot, whether more than one gun was used, and the number of bullets used. Although preliminary, results for New York City indicate that one month after implementation, overall crime had decreased by 10%, shootings were down by 33%, and transit crime had decreased by 20%.

- **Evidence-based planning, operations, and service delivery.** Evidence-based service delivery leverages big data analytics and the IoT, in conjunction with adjacent IoT use cases, to remedy widespread social problems; indeed, a critical IoT success factor is seamless integration with business analytics. For example, IoT-enabled initiatives that draw upon the dynamic pricing of "naturally imperfect" (bruised or aesthetically unappealing) produce could help with school programs designed to affordably diminish childhood hunger. In public safety, law enforcement organizations are leveraging the evidence drawn from disparate data sets to understand where there are the most calls for service, the most accidents, the most gunshots, etc., and therefore where to deploy officers. Social housing initiatives also stand to benefit immensely from IoT implementations geared toward asset management. Tracking IoT-generated data allows social housing organizations to make informed decisions about optimized maintenance and repair schedules. Installed sensors on electrical mains and water pipes or humidity sensors to detect mold are all very real and necessary applications to deliver on improvements in government-funded social housing projects. Governments are using big data analytics to identify and predict properties at risk, targeting IoT investments from there.
- **Cost savings and revenue growth.** Some of the information channeled by the IoT is, obviously, already collected by people. As governments struggle to manage budgets and resource allocation, there are real benefits to leveraging the IoT to collect information without human intervention, allowing for the information to be collected more frequently and in greater detail. Simply put, the IoT allows government agencies to use people where and when they are necessary and IoT sensors where human intervention is unnecessary. IoT cost savings can be found in a number of key areas, including employee productivity, efficient resource utilization, reduced operating costs, and more efficient revenue generation. Smart parking initiatives generate both cost savings and new revenue streams. The Smart City Barcelona initiative is targeting an increase of \$50 million annually in parking fee revenue from the use of smart parking technologies.
- **Social and environmental returns.** Environmentally related IoT solutions are legion and are having very real social impacts globally. Smart lighting solutions span a number of micromarkets, including smart bulbs, switches, and glass (LIFX, Luxera, Kinestral, Enlighted) and smart energy (Sunrun, Ecofactor, Keen Home). In Copenhagen, the use of IP-enabled sensors and LED lighting in streetlights has led to cost savings and reduced energy consumption as lights dim and brighten depending on surrounding activity, as well as much faster response times by city staff to address issues.

**Q. How are governments approaching IoT?**

- A. As noted previously, the converging thunderhead of dire budgetary constraints, demographic shortages, consumerization of IT, and skyrocketing citizen expectations means that the IoT, by necessity, will factor into planning, operations, and delivery. As governments globally adopt "digital by default" and omni-channel approaches to service delivery, organizations are gaining a more granular understanding of where HR is critical to customer experience and where it makes economical and business sense to leverage newer technologies like the IoT, as well as where it makes sense to combine the two.

Barcelona has recently begun deploying drones to monitor water quality and repairs in its sewer systems — many of which are in remote underground and/or difficult-to-get-to locations. Each drone is remotely controlled by an operator who monitors a video feed from the drone's camera as the drone weaves through the pipes — doing the dirty work, taking water samples, etc.

**Q. What are pitfalls to be avoided, and what are the essential first steps toward IoT?**

- A. Early success stories in government constellate around some common best practices. The essential first steps are to create the business case, understand the organization's technological and human resources assets and strengths, prioritize obvious use cases and low-hanging fruit, and encourage efficient long-term integration by demanding standards-based interoperable solutions from the vendor community. To be sure, IoT solutions will need to be flexible and interoperable to encourage adoption. Second, organizations need to focus on developing IoT-enabled core services rather than extraneous or tangential business lines. Third, IoT implementations must tackle the proverbial two-headed monster: threading security throughout the entire IoT suite while proactively working with stakeholders to surmount privacy hurdles — gaining traction early on by dispelling fear.

**Q. What makes for a good IoT solution?**

- A. As noted previously, the IoT is an integrated suite of technology and business processes and services set upon a key business imperative. Effective IoT solutions need to have a full suite of solutions in place (applications, analytics, platforms, connectivity, and intelligent systems) and at an appropriate stage of relative maturity.

Conversations about IoT quickly default to a discussion about endpoints — sensors, wearables, and surveillance cameras. Good IoT solutions are broader than just technology; they pay attention to the implications on the business process and the people involved in, and affected by, implementation. In that regard, the IoT is no different from other technology deployments, which are most frequently stymied by cultural transformation issues.

**A B O U T   T H I S   A N A L Y S T**

*As research director with IDC Government Insights, Alison Brooks leads IDC Canada's public sector research with the Canadian IT Opportunity: Government practice area. Ms. Brooks provides valued advice and insight to her clients — both technology vendors and government officials — through her research programs and in consulting engagements. Her understanding of federal, provincial, and municipal I&IT initiatives helps vendor clients position technology offerings as meaningful solutions to current and emerging program and policy priorities. Additionally, she guides government technology officials with best practice assessments and funding strategies, identifying technologies to improve processes and program outcomes.*

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Global Headquarters: 5 Speen Street Framingham, MA 01701 USA P.508.872.8200 F.508.935.4015 [www.idc-gi.com](http://www.idc-gi.com)