Innovative, Cost Efficient

Smart City Connectivity

Using LoRaWAN™ Technology

Innovative, Cost Efficient
Smart City Connectivity
Using LoRaWAN™ Technology

EXECUTIVE SUMMARY

Cities around the world are searching for long-term, sustainable methodologies, and technology to help support better ways to manage assets, energy, and infrastructure. In essence, they are looking for their city to become smarter to keep up with today's smart and connected citizen.

The role of a Smart City today is about collecting data from a city's assets and using that data to improve resource sustainability, enhance public service delivery, reduce operational costs and enrich their community experience. Low power wide area networks [LPWAN] based on the LoRaWAN™ [long range wide area network] protocol enables smart sensing and infrastructure control. This enablement allows cities to securely and efficiently collect and analyze data from an almost unlimited number of connected devices to facilitate faster, evidence-based decision-making with regards to the services they offer.

LoRaWAN-based networks are optimized for the Internet of Things [IoT] and Smart City applications that require low-cost battery-powered devices that have a long life, lasting 10 or more years. Utilizing low cost, long life wireless devices results in almost zero maintenance and when combined with low connectivity fee's, results in very low total cost of ownership Smart City initiatives.

eleven-x Smart City solutions offer budgetary benefits for cities from a couple of perspectives;

1) Low total cost of ownership Smart City solutions that utilize long life, low-cost, battery powered sensors that require almost zero maintenance.

2) The money saved by implementing these solutions can then be used to fund and support other much needed programs such as food subsidizing programs or improving public transportation.

But the positive budget impact doesn't end with just the cost savings in terms of deploying these innovative applications. Cities can utilize the dollars saved by these low power Smart City applications to introduce or enhance other needed programs to help improve the quality of life for their citizens. Imagine an average size city being able to save $700,000 per year by moving to adaptable street lighting, then taking that money and applying it to key city programs designed to help with food subsidy programs or to improve public transportation to help those in need have more employment opportunities. Think how this could raise the standard of living and the quality of life within your city.

SMART CITY APPLICATIONS AND DEVELOPMENTS

At the heart of Smart City initiatives is data collection from a city's assets and infrastructure, typically things that have not been practical to connect with previously. Today's IoT and Smart City implementations are looking to automate certain tasks and|or procedures that have previously been wired or manually completed, or they are connecting sensors in key applications where the data collected can help the city with decision-making.

The range of Smart City applications is broad, with a variety of areas having already been tested with measurable positive results being recognized. From more efficient parking resulting in improved traffic flows, to adaptable street lighting offering reduced operational costs, to smart metering enabling real-time usage measurements resulting in improved billing and a better customer experience. Below are some examples of LoRaWAN-based Smart City solutions available for deployment today;

- **Smart Parking** – typical use cases involve alerting drivers the location of available parking spaces. Additionally, the data collected from the parking assets can be used to develop parking profiles to support longer-term asset and infrastructure planning.

- **Smart Street & Area Lighting** – A significant expense for city budgets, and a major energy guzzler, street and area lighting is a key budget area where Smart City technology can help. From reducing operational costs to cutting greenhouse gas emissions by requiring less energy consumption, Smart Lighting can also help provide increased safety while improving services for citizens.

- **Smart Metering** – wirelessly connecting meters offers 100% accurate usage measurements, reduces operational costs through the elimination of manual or drive-by readings and improves the overall customer|citizen experience with easy-to-understand bills and no disruptions to service for reading or upgrades.

- **Smart Bin|Fill-level Monitoring** – From waste to liquids to clothing depots, a Smart Fill-Level Monitoring program allows organizations to optimize routes and schedule pick-ups or fill-ups based on a data-driven management process reducing operational costs and emergency call-outs.

- **Asset Tracking & Monitoring** – Unpowered assets such as light poles, street signs, equipment, trucks, and plows can all be tracked and monitored to help keep those items in the field longer and with improved visibility for maintenance.

- **Air Quality** – A low power solution offers cities an opportunity to monitor both indoor and outdoor air quality to identify problem areas across their city through data collection to help with the implementation of measurable air quality control programs.

ROI AND ACTIONABLE INTELLIGENCE

While the term "Smart City" tries to be inclusive promoting a singular definition, the truth of the matter is that no two cities have the same needs. Each city will have different requirements for each of the programs and services they offer. However, the ultimate goals for each city with each program will have a common set of objectives; improve resource sustainability, enhance public service delivery, reduce operational costs and enrich the community experience.

The following are some real-world examples of how some eleven-x Smart City implementations are currently benefiting communities across Canada:

o   **Improved traffic flows for the City of Stratford** – a small city located in the heart of Southern Ontario possess a population of 31,645 permanent residents and efficiently finding a parking space is already somewhat of an arduous activity. From springtime to fall, the city welcomes approximately 1 million visitors who arrive to attend events such as the Stratford Festival. While the influx is great for the local economy, it does cause a strain on the city's infrastructure. With the deployment of the eleven-x low power network and smart parking pucks being embedded into the asphalt of parking spaces throughout the city, drivers can use an app to quickly show them where available spaces are located. Additionally, data is collected from parking space usage to build out complete parking profiles for all the city's parking assets enabling data-driven decision-making for processes and resource planning.

o   **The Region of Waterloo streamlines monitoring of precious resource** – The Region of Waterloo utilizes a combination of 717 production and monitoring wells to assess impacts to and extract water from local sand, gravel and rock aquifers from the Waterloo Moraine. The Moraine provides drinking water for over 350,000 residents and about 75% of the potable water for the region. The implementation of wireless LoRaWAN devices connected to the eleven-x network has resulted in hourly status updates on the wells, an alert feature based on pre-determined levels and thresholds and all for approximately half of the cost of the traditional data collection methodology.

o   **QMC | Alectra Energy Services offer improved billing and services** – Customers of Alectra Energy Services will no longer be subjected to confusing monthly bills, be disrupted to have their meters read or have their service interrupted for upgrades. QMC and eleven-x have partnered to initiate the rollout of a LoRaWAN-based wireless Smart Water Meter solution for the customers of Alectra Energy Services in Canada. The new Smart Metering Service offers significant service improvements including 100% accurate usage data as part of their billing. Customers can also expect enhanced service such as more detailed usage information which will allow them to make more informed decisions about their water use. Additionally, the more detailed information will also help with faster detection of leaks, which will also have a positive impact on the environment.

WHY LoRaWAN FOR SMART CITY IMPLEMENTATIONS?

If the role of a Smart City is connecting with their assets and infrastructure to collect data, cities need to ensure they are selecting the right technology for the solutions they want to roll out. While cellular networks have their place where data communication requirements include images and video, typical Smart City use cases require low bandwidth, long range, wireless data transmissions and with over 40 million sensors deployed globally, LoRaWAN is the undisputed leader in LPWAN [low power wide area network] connectivity for IoT and Smart City applications.

- o **Technical Advantages**
  - **Low-Cost Battery-Powered Devices** – wireless devices are low cost and have a typical lifespan of 10+ years
  - **Long Range** – reliable connectivity in urban and indoor environments with connectivity extending up to 48km.
  - **Open Standard** – enables open data environments which allow the city to provide access to businesses, schools and individuals to design, build and deploy solutions specific to their city.
  - **Secure** – LoRaWAN utilizes 128-bit AES encryption so data and privacy are always protected.
  - **Scalable** – cities can add as many LoRaWAN devices, and varying types, to the network at any time they need.

  > eleven-x operates Canada's first and only public coast-to-coast IoT network optimized for Smart Cities. It offers open data architecture which allows cities to provide access to businesses, schools and individuals to design, build and deploy solutions specific to their city. The secure network is scalable to allow for almost limitless connections of low-cost devices to collect data from assets and infrastructure.

- o **Organizational Advantages**
  - **Low cost of ownership programs** – the combination of low-cost devices, low connectivity fees, almost zero maintenance and long life means innovative Smart City initiatives that will fit in your budget.
  - **Available Now** – a large number of Smart City applications have been tested, deployed, and are available now for implementation.
  - **Fit within a Smart City strategy** – Because of the low cost of ownership when compared with other technologies, LoRaWAN is the right choice for the large majority of typical IoT and Smart City applications. Include the scaling capabilities, and the value is even more evident.
  - **Established ecosystem** – supported by a global alliance of over 500 of the world's leading tech companies, LoRaWAN offers an open standard and a wide and growing range of available devices.

CONCLUSION

As cities look for new ways to fulfill their strategic and economic development plans, technology can provide cost-effective, innovative solutions for improved resource sustainability and enhanced public service delivery while reducing operational costs to offer an enriched community experience. A low power network, based on LoRaWAN, offers a scalable, low total cost of ownership program that can provide the flexibility needed for today's evolving cities and for their future.

LoRa Alliance Member™   LoRa™ and LoRaWAN™ marks used under license from the LoRa Alliance™

About eleven-x Inc.

eleven-x operates Canada's first and only coast-to-coast public low power network that enables the promise of Smart Cities, Smart Buildings and Campuses, and Enterprise IoT applications. Supporting the use of low cost battery powered sensors, the LoRaWAN™ based network addresses many Internet of Things [IoT] use cases where requirements include wireless connectivity, devices that require long battery life, no maintenance and a low total cost of ownership.