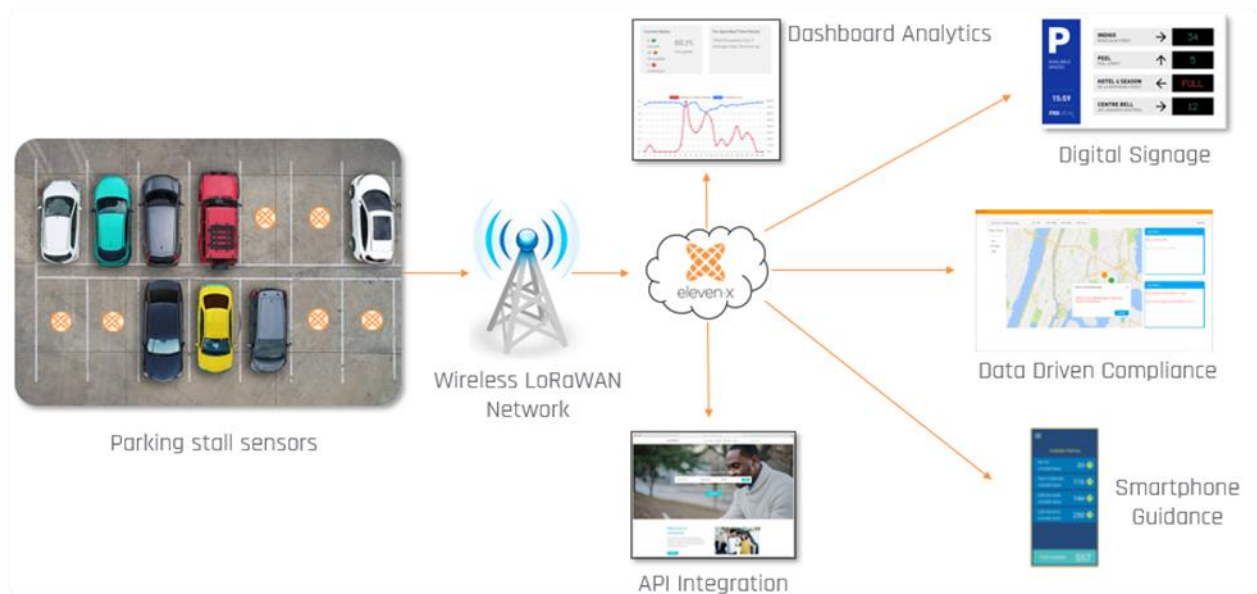


POWERFUL PARKING PERFORMANCE DATA & MORE

Smart Parking Starts at the Stall with Sensor-Based Monitoring

The [eXactPark](#) Smart Parking Solution is made up of the following components to deliver a fully functional tool for Parking Administrators, Business & Economic Development Professionals, and everyday drivers looking for available parking:



1. **Stall Based Sensors:** Recognizing parking as one of the most common challenges that IoT solutions could help solve, eleven-x evaluated LoRaWAN® parking sensors from all over the world and none of them met what we believe the North American market needs, namely accuracy, longevity, reliability, and durability for a sensor that would need to withstand various challenging environmental conditions.

Thus eleven-x designed our SPS-X smart parking sensor to be a game changing LoRaWAN-based device that utilizes multiple technologies including magnetic sensing, radar, Bluetooth (BLE), and A.I. to provide real-time parking stall occupancy with 10-year battery life expectancy. The award winning, patent-pending SPS-X sensors are quickly and easily deployed without the expense of running wires through conduit and are simply commissioned using the eleven-x smartphone app. Notably the sensors are ruggedized and rigorously tested, meeting IP67 standards for water and dust incursion and are anticipated to have little to no maintenance over the 10-year battery life. The SPS-X has been purposely designed, tested, and deployed to exceed expectations and survive the harshest weather conditions.



Frequency: NA Standard: 902-928 MHz

Transmit Power: Up to 20dBm

Certifications:

- FCC Part 15.247
- ISSED RSS-247

Operating Temperature: -40°F to 176°F

Battery Life: up to 10 years

Humidity: 0% - 100%

IP67 rated SPS-X sensors; surface mount (L) and in-ground (R) models shown

Traits that make the award winning, patent pending eleven-x SPS-X ideal:

- The In-ground model is completely embedded within asphalt so there is no chance of removal or damage by maintenance equipment. Installation is done in under 15 minutes.
- The surface mount model is ideal for parking garages and is easily deployed in under 5 minutes. This can be done without drilling or affecting structural or surface integrity.
- Multiple sensing technologies combine to achieve a much greater accuracy than any other sensor available providing >99% accuracy in detecting vehicles under normal operating conditions.
- The SPS-X boasts a 10-year battery life; double what most vendors lay claim. Battery life status is reported and displayed as a percentage range 0-100% in the dashboard application allowing for easy lifecycle planning.
- Ruggedized for exceptionally harsh environmental conditions.
- Optimized for long range communications and penetration of concrete structures.
- The sensor contains 75% recyclable and/or recoverable materials.
- The SPS-X is North American designed, ensuring quality, and supporting well-paying jobs.

2. **Network Gateways:** A network gateway forms the bridge between the data collected by the SPS-X parking sensors and the eleven-x network servers. Boasting carrier-grade network reliability, eleven-x is responsible for the network design, implementation, management, and ongoing monitoring & support of the gateways. Gateways can be purchased from over 20 manufacturers in a wide assortment of configurations, but the most typical use simple AC powered and cellular backhaul for ease of deployment.

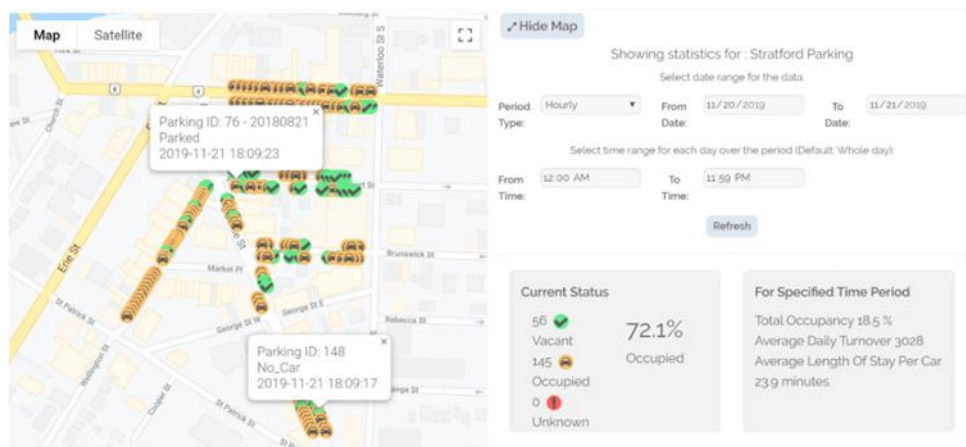


LoRaWAN® Gateways: Outdoor (L), and Indoor (R)

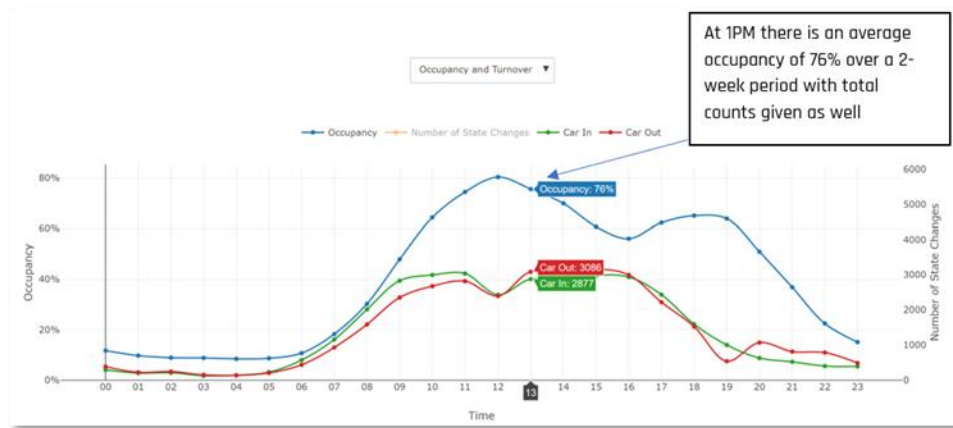
3. **Dashboard Application:** Real-time stall availability is made available through the eXactpark web application, which enables analytics and data visualization. Users have visibility into real-time and historical stall occupancy, turnover, duration of stays, and the ability to set alarms & alerts for enforcement personnel. API data is available from the dashboard for easy integration to other software applications like dynamic digital signage, and navigation apps to show users real-time availability and navigate them directly to their preferred open stall locations.

Dashboard Features:

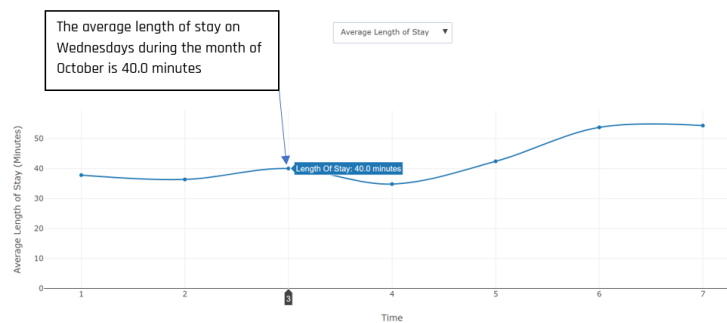
- Access to real-time and historical data through an easy-to-use web interface dashboard.
- Comprehensive visibility into how service bays & parking inventory is being used.
- Creating & controlling zones that enable better decision making.
- Data is securely and reliably collected, stored, and maintained in the cloud.
- Planning becomes data-driven decision making.
- Data is collected anonymously, eliminating any privacy issues.
- Alerts can be customized based on zone or time of use, to create efficiencies.
- Everything is cloud-based and wireless so no need for local IT support.



Screenshot of real-time parking utilization & analytics dashboard



Screenshot of Dashboard Analytics: Occupancy & Turnover during a 2-week period



Screenshot of Dashboard Analytics: Average length of stay during a specified time

4. **Installation App:** Installing eleven-x smart parking sensors is quick and easy using the Android App available on Google Play for download. Users have login credentials which enables the App to securely communicate with sensors using Bluetooth Low Energy (BLE). The user simply scans the sensor's QR code, activates the sensor, assigns it to a stall, and does a final system check, all in under 3 minutes. Sensor firmware can be updated over-the-air or by using the Android App, and the App can be used for sensor diagnostics.

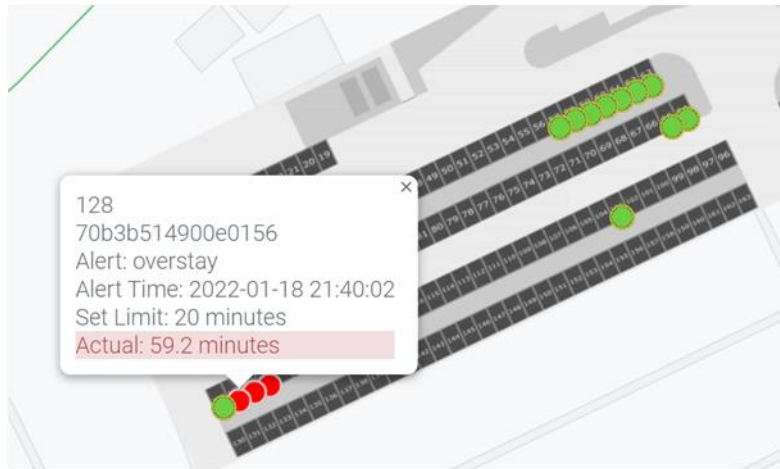
The following short videos demonstrate how SPS-X sensors are quick and easy to install (surface mount takes 5 minutes, in-ground takes 15 minutes):

- [SPS-X in-ground video](#)
- [SPS-X surface mount video](#)



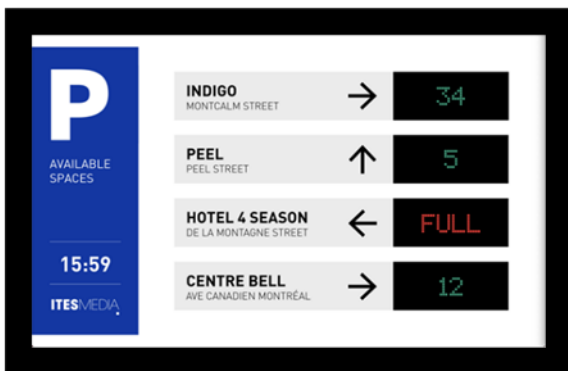
Screenshot of eleven-x smartphone App

5. **Enforcement:** The eleven-x dashboard allows parking administrators to set overstay alarms and alerts that are specific to different zones, stall types, and for different durations. Setting a 3-hour alarm for main street, and a 15-minute alarm for loading zones is all done in the dashboard and enables smart enforcement by sending personnel where they will make the most impact.

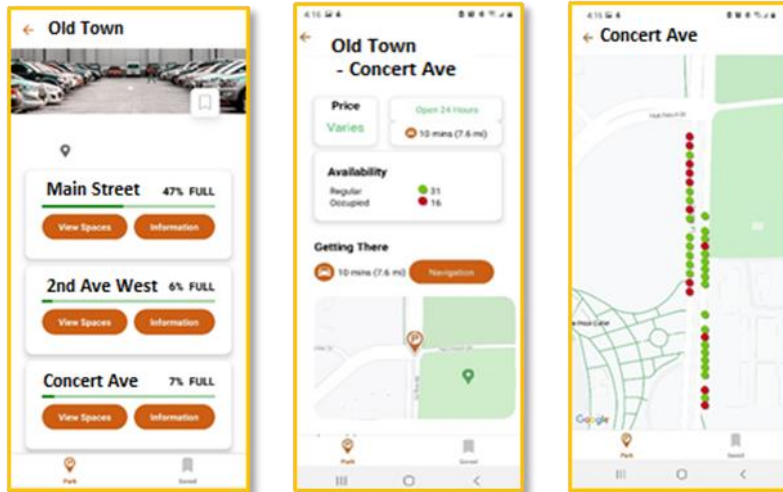


Screenshot of Enforcement capabilities: the sensor has detected an overstay in a 20-minute zone

6. **Augmenting the user experience with Digital Wayfinding and Navigation Apps:** One of the recurring themes we hear is that finding parking is a hassle, scares people away, and causes drivers to circle & burn fuel needlessly. eXactPark is designed to integrate with digital parking displays of all types to lead drivers to the available parking, and our Navigation App allows users to select an address or zone, and be led to the available parking using a smartphone's mapping application (ie Google maps)



Sample customizable displays with directions



Sample Navigation App showing real-time stall availability

The final product is a full-featured smart parking solution that provides the most data & analytics, enables smarter enforcement, and leads drivers directly to open spots in real time. Beautiful and elegant in its simplicity – yet innovative and game changing for your community.

To learn more about the benefits, please check out this great blog from my colleague Kuljit Saggu.

About the author:

John Cherewko is an experienced Sales & Marketing Professional with a lengthy background in automating municipal services to create efficiencies, derive actionable insights from the data, and create a better user experience. John has worked with hundreds of municipalities across North America and helped leverage the power of IoT solutions for smarter operations in parking, water & gas metering, air quality monitoring, and other environmental monitoring. At the heart of this the goal is to create a more sustainable future for his 2 children, whom he coaches in hockey. John has a history of involvement with not-for-profits and is currently the Chair of a school for special needs children.

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