City of Montreal | Dimonoff

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Private: City of Montreal

One of the largest smart lighting projects in North America

Overview

One of the largest smart lighting projects in North America, converting an entire city's street lighting infrastructure from standard high-pressure sodium (HPS) fixtures to connected and remote-controlled LEDs, is underway in Montreal, Canada. Set on an island in the St-Lawrence River, this cosmopolitan city has a population of more than 2 million people and is known as one of Canada's most vibrant cultural, economic and touristic powerhouse. Given its favorable geographical attributes, awesome lifestyle, and its French-based innovative culture, Montreal has been one of Canada's fastest-growing cities, attracting and retaining a wide range of businesses as well as residents from all over the world.

TOTAL FIXTURES	250 000
COST OF ELECTRICITY CONSUMPTION IN 2015	
ENERGY CONSUMPTION SAVING	$12.9M CAD
MAINTENANCE SAVING	55%35%
FINANCIAL PAYBACK PERIOD (ENERGY SAVINGS ONLY)	

Project Highlights

TOTAL PROJECT COST

$110M CAD

ESTIMATED SAVINGS

$219M CAD
/ 20 years period

GREENHOUSE GAS REDUCTION

123 tons
/ years

INNOVATION

Gradual integration of digital and dynamic snow removal panels, parking signs and other IoT sensors.

SAVINGS ONLY)	
	8 years

The Challenge

The city of Montreal is illuminated with more than 250 000 fixtures distributed through 19 boroughs. Among this number, 138 000 street lights are cobra head and 111 500 are decorative light. In 2016, 70% of these fixtures reached their end-of-life expectancy and needed to be replaced. Consequently, the city took the decision to convert its HPS fixtures that they had been using for several years, to LED fixtures which require less energy and have higher life expectancy. Beside this modernization need, the lighting system at the time did not allow remote computerized management. Street lights were equipped with a simple controller that used a photocell to turn them on or off. The whole infrastructure was obsolete and needed improvements that could accommodate new capabilities such as inventory management, maintenance management and telemetry.
Here is a non-exhaustive list of problems the city faced that prompted the city to convert it's legacy lighting infrastructure into a smart lighting system:

- ✔ Impossible to guarantee street lighting performance;
- ✔ No inventory of deployed equipment was available;
- ✔ Absence of a management system that could account for interventions and maintenance operations that were routinely performed on the lighting infrastructure;
- ✔ No scheduling function available
- ✔ Status of the equipment or maintenance operation could not be monitored or recorded for proper reporting.
- ✔ Light intensity adjustment was not possible;
- ✔ No automated detection of faults;
- ✔ Warranty management history not available;
- ✔ Preventive measures to replace / maintain the equipment was impossible to plan ahead of time and therefore imprecisely budgeted.

What's being done?

Montreal is now undertaking a full LED streetlight conversion project, a $110M investment to replace of all of its 138 500 high-pressure sodium (HPS) cobra head type with LED. The remaining 111 500 decorative and other types of fixtures will also be converted in a subsequent phases. Litenode^{TM} wireless relays and Gateways from DimOnOff, combined with nodes from other companies are installed on every fixture throughout the city. Conversion began in December 2017 and is planned to be completed in 2022. Considering the proven leverage provided by smart street lights as a backbone for many smart city applications, Montreal positions itself once again at the forefront of innovation by combining its lighting infrastructure network with advanced technology, enabling optimized management of all IoT city

advanced technology, enabling optimized management of all IoT city assets and devices already in use or installed in the future.
To manage all these new smart lighting fixtures, the city adopted SCMS Connect{ED} : a state-of the art IoT management platform developed by DimOnOff. Whether they are equipped with an external node or an internal node in the case of the decorative luminaries, agnostic of vendor, every street light will be remotely managed and diagnosed using this platform. Specially equipped with RF communication combined with innovative, secure and robust firmware, Montreal's street lights are now able to communicate with each other as well as connect with various sensors or IoT devices. By deploying a secure smart city network over the entire city, the city is taking a big step forward in favor of the digital revolution.

Benefits

Besides providing the control of every street light remotely and in real time, SCMS Connect{ED} maps the city's connected assets and devices and instantly detects their state of operation, allowing failures, power outage and other anomalies to be detected and efficiently resolved. The city can adjust the brightness of part or all of its street lights and measure the change in electricity consumption in real time. This multicomponent system allows for scalability and addresses the most important criteria of any innovative smart city network: security and adaptability/interoperability to new technologies and future applications. As a first newfangled IoT add-on remotely managed using DimOnOff' SCMS Connect{ED}, Montreal is gradually integrating digital parking signs and digital snow removal panels.
Here are, in summary, the main advantages of Montreal's smart lighting system :

- ✔ Real-time monitoring of lighting performance 24/7;
- ✔ Real-time energy consumption;
- ✔ Systematic up-to-date equipment and operations inventory;
- ✔ Alarms are triggered when failures or service errors or interruption occur;
- ✔ Customizable lighting control scenarios: events, absence of traffic, city operations, construction sites, 911 calls, etc.;
- ✔ Optimization of maintenance planning;
- ✔ Customizable assignment of control and management responsibilities of all smart city applications connected to the smart lighting network.

Ressources

Projet – Éclarage de rue au DEL (in French):
http://ville.montreal.qc.ca/portal/page?_pageid=8957,142611730&_dad=portal&_schema=PORTAL
Guide d'aménagement durable des rues de Montréal – Éclairage (in French) :
http://ville.montreal.qc.ca/pls/portal/docs/PAGE/TRANSPORTS_FR/MEDIA/FASCICULE%20%C9CLAIRAGE.PDF

http://ville.montreal.qc.ca/pls/portal/docs/PAGE/TRANSPORTS_FR/MEDIA/FASCICULE%20%C9CLAIRAGE.PDF

Le projet de contrôle intelligent de l'éclairage public de la Ville de Montréal (article in French): https://www.lemondedelelectricite.ca/articles-recents/2868-le-projet-de-controle-intelligent-de-l-eclairage-public-de-la-ville-de-montreal