



**REALTERM**  
ENERGY

 **peterborough**



Case Study:

## City of Peterborough's Smart LED Streetlight Upgrade

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*Increased Safety & Decreased Carbon Footprint*

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# Peterborough's Smart LED Streetlight Upgrade

The City of Peterborough is located in central Ontario within the Kawartha Lakes region and is home to approximately 84,000 residents.

## OVERVIEW

- RealTerm Energy was selected for a full turnkey LED conversion
- Smart Controls were deployed
- 7,205 fixtures were installed
- 70% reduction in energy consumption (kWh)
- 58% savings in operating costs, approximately \$836,065/year
- Approximately 2558 metric tons of greenhouse gas eliminated, equivalent to 553 cars removed from the road.

## BENEFITS OF AN LED UPGRADE

- 55 to 80% savings in energy consumption
- Up to 80% maintenance reduction
- Improved visual acuity
- Reduced light pollution
- Reduced greenhouse gas emissions

## OPPORTUNITY

In 2017, the City of Peterborough wanted to significantly reduce its energy consumption, maintenance costs, and the environmental impact associated with its network of streetlights. The City realized that once the LED streetlights were installed, they could not only achieve substantial energy and cost savings but also improve its overall lighting quality and roadway safety for both vehicle and pedestrian traffic. Additionally, the City explored the opportunity to deploy smart controllers at the same time as the upgrade, which would give them adaptable lighting levels, additional energy savings through city-determined dimming profiles, plus real-time asset management capabilities that would reduce on-going maintenance costs.

The new LED fixtures will cut Peterborough's streetlight energy consumption by approximately 70%, as LEDs require significantly less electricity than the high-pressure sodium lights that were previously in place. The upgrade will also decrease annual streetlight maintenance costs by up to 80%, due to LED's solid-state technology which last up to five times longer than the City's existing streetlights. The new LED lights also include a 10-year warranty.

By converting its 7,205 streetlights to LED, the City will reduce its greenhouse gas emissions by approximately 2558 metric tons over the lifetime of the fixtures. This is equivalent to eliminating greenhouse gas emissions from 553 passenger vehicles driven for one year - thus reducing Peterborough's carbon footprint.



## SOLUTION

The design team performed photometric analyses for 7,205 cobra head fixtures. The design plans utilized a 3000K color temperature throughout the City, as it offers pedestrian comfort without compromising the safety and visual acuity required in higher classified roads and areas of high pedestrian activity. 3000K is a solid choice for residential and commercial area illumination, and for municipalities that want to ensure Dark-Sky compliancy. Additionally, it was determined that Cree luminaires yielded the best balance of energy savings, cost efficiency and long-term performance as part of the LAS program. Preference was given to fixtures that would maximize available incentives to the City. It was calculated that after the upgrade, the Town's annual electrical consumption would decrease by 70% and Peterborough would see a decrease of 58% in their annual electricity costs.

The City directed RealTerm to conduct a Request for Proposal (RFP) for the smart controllers. RealTerm set the parameters of the RFP, in conjunction with the City. Seven smart control manufacturers responded to the bid, and each were evaluated for technical compliance, functionality, product specifications, user friendliness and price. The top three bidders were invited to demonstrate their products and solutions to a select panel of city staff.

## PETERBOROUGH'S DESIGN LEGEND



Point	Wattage	Distribution
1	33 W	Type II
3	38 W	Type II
5	43 W	Type II
6	43 W	Type III
7	55 W	Type II
9	61 W	Type II
16	79 W	Type III
18	88 W	Type III
22	107 W	Type II
33	160 W	Type III

## SMART CONTROLS

RealTerm Energy deployed DimOnOff's Honeywell/Elster-based smart controls for the City's streetlights in order to provide a cost effective and modular platform for deploying network and smart city services. Smart controls were also deployed on existing LEDs, approximately 250 streetlights were added to the network.

This allows for optimizing environmental benefits and cost savings of a streetlighting controls program while creating a wireless communications network that can serve as the foundation for future "smart and connected city" offerings, both lighting and non-lighting related.

Furthermore, these smart controller's Honeywell/Elster radio meshes into the local utility's existing Honeywell/Elster AMI network used for both electric and water metering. This helps to improve the overall communication reliability by "densifying" the network. By expanding the needs analysis beyond those of just the City, RealTerm Energy sought a solution that married the technical and physical needs of both the City and the Utility.

The training provided for smart controls was effective as the client was able to take over the system soon after installation. They were also very impressed with RealTerm Energy's Esri mapping software and the dashboard created for the City.



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## The Energy to do Great Things

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*Working with an experienced firm such as RealTerm on this project allowed for a smooth project deployment. Having many stakeholders involved could have made things complicated but all aspects were carefully planned and executed under RealTerm's orchestration. Serving multiple purposes in a Smart City infrastructure, the intelligent lighting network and flexible central management platform are the foundation for future integrations that will help provide Peterborough's citizens a good quality of life for many years to come.*

Daniel Noiseux P. Eng. MBA  
DimOnOff

*Ensuring you have the right contractor working with you is mission critical. Knowing going in there that there will be issues and bumps along the road is a given with any large project. RealTerm provided great services and although Peterborough Distribution Inc. was not the client, the streetlights were riding on our AMI system, so we were involved. The system was deployed after a few bugs had been ironed out. Post project completion, we needed a separate system to collect our water meter data. Using the streetlight nodes to transfer data from the water meter to collectors will serve PUGSC now and into the future with expansion of water metering and lighting controls.*

David Whitehouse  
Vice-President Customer / Corporate Services  
Peterborough Utilities Group



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