



# Proposal to the Town of Pelham

## LED Streetlight Conversion

September 2<sup>nd</sup>, 2021

O-0270

**Primary Contact:**

Francisco Reinoso

Senior Director, Operations

2160 de la Montagne, Montreal, QC H3G 2T3

(514) 420-1146

[freinoso@realtermenergy.com](mailto:freinoso@realtermenergy.com)



**REALTERM**  
ENERGY

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September 2, 2021

Derek Young  
Manager of Engineering, Public Works  
The Town of Pelham  
20 Pelham Town Square, P.O. Box 400  
Fonthill, ON L0S 1E0

Dear Mr. Young,

Thank you for your interest in upgrading your street lighting network with RealTerm Energy. Our team at RealTerm Energy brings energy experts, financial analysts, lighting designers and boots-on-the-ground lighting technicians, working together to achieve smart solutions that will deliver approximately **74%** cost savings to your streetlight operating bill in the first year.

We are committed to helping communities immediately realize the savings that LED lights can provide and we're proud to offer this service to the Town of Pelham.

You will find included a preliminary LED life-cycle cost analysis based upon data provided by the Town. This analysis is only a starting point and demonstrates the energy savings that are possible using LED streetlight technology while deploying industry standard roadway practices.

Our turn-key service offering includes:

- An initial assessment of your existing streetlight network
- Complete photometric designs to optimize energy efficiency and minimize costs
- A comprehensive Investment Grade Audit (IGA)
- New LED installation and recycling of old fixtures
- Transfer of all inventory files and data
- Transfer of all warranties at commissioning

We manage our conversion projects in a transparent fashion. We will keep the Town of Pelham informed of all progress during each phase of the project. Fiscal monitoring of this project, on the Town's part, will be an easy process facilitated by regular meetings and continually accessible reports.

The RealTerm Energy team appreciates this opportunity to present our proposal. We look forward to the prospect of working with the Town of Pelham to design and install your new, highly efficient LED street lighting system. We are passionate about what we do and want you to feel the same way about this project's results.



Angelos Vlasopoulos, Chief Executive Officer  
[avlasopoulos@realtermenergy.com](mailto:avlasopoulos@realtermenergy.com)

## 1. EXECUTIVE SUMMARY

<b>Technical/ Environmental Assessment</b>	Title	Town of Pelham Streetlights
	Baseline	1,260 HID <sup>(1)</sup> Cobrahead fixtures 62 HID Decorative fixtures  Total demand: 164.1 kW Annual energy consumption: 708,326 kWh Annual operating hours: 4,320 (Hydro One), 4,300 (NPE)
	Technology Employed	Smart ready LED Fixtures
	Technology Provider(s)	To be confirmed
	Technical Specifications	7-PIN, Smart ready fixtures Color temp: 3000K Average life ≥ 100,000 hours CRI ≥ 65, IP ≥ IP 65
	Fixture Warranty	10 years
	Annual Savings	Energy: 524,194 kWh (74%) Operating Cost: \$166,656 (74%)
<b>Financial Assessment – Photocell Option</b>	Financing Scheme	Financed by Pelham
	<b>Project Cost</b>	<b>\$621,810</b>
	Project Reference Period	23 Years
	20-Year Project Savings	\$3,729,896
	Payback Period	3.6 Years
<b>Smart Controls Option</b>	Smart Controls Net Adder	\$211,199
	<b>Total Project Cost with Smart Controls</b>	<b>\$833,009</b>
	Payback Period	4.9 Years

(1) – High Intensity Discharge.

(2) – Note that this proposal presents two options, one for standard photocells (dusk-to-dawn) control devices, and an alternative option for smart controls on each streetlight to provide enhanced system management, dimming control and reporting capabilities.

## 2. PRELIMINARY LED ANALYSIS

Our team has reviewed the Town of Pelham existing inventory and has developed a preliminary LED lighting replacement plan, project cost and savings summary. The baseline inventory presented was established using data provided by Pelham. For any assumptions made regarding the baseline inventory, please refer to the *Notes & Calculation Assumptions* section of this proposal report.

We have depicted generic LED luminaires with comparative lumen outputs for all existing HID fixtures recorded in the Town of Pelham most up-to-date inventory. This analysis is only a starting point and demonstrates the energy and cost savings that are possible using LED technology. Final manufacturer selection and revised energy and cost savings will follow, after the product selection and design review phase of the Investment Grade Audit is completed.

### 2.1. Current Inventory and Proposed LED Replacements

HID Fixture type <sup>(1)</sup>	HID System Wattage	HID QTY	Total HID Demand (kW)	LED Fixture type	LED System Wattage	LED QTY	Total LED Demand (kW)	Savings
<b>COBRAHEAD FIXTURES</b>								
NPE HPS 70W	100	139	13.9	27W_Cobrahead LED	27	139	3.8	73%
NPE HPS 100W	130	96	12.5	33W_Cobrahead LED	33	96	3.2	75%
NPE HPS 150W	190	46	8.7	54W_Cobrahead LED	54	46	2.5	72%
NPE HPS 250W	310	1	0.3	81W_Cobrahead LED	81	1	0.1	74%
NPE HPS 400W	475	3	1.4	135W_Cobrahead LED	135	3	0.4	72%
HO HPS 70W	100	265	26.5	27W_Cobrahead LED	27	265	7.2	73%
HO HPS 100W	130	703	91.4	33W_Cobrahead LED	33	703	23.2	75%
HO HPS 150W	190	7	1.3	54W_Cobrahead LED	54	7	0.4	72%
<b>Subtotal (Cobra)</b>		<b>1,260</b>	<b>156.1</b>			<b>1,260</b>	<b>40.6</b>	<b>74%</b>
<b>DECORATIVE FIXTURES</b>								
HO Post Top 100W	130	62	8.1	33W_LED Post Top	109	62	2.1	75%
<b>Subtotal (Deco)</b>		<b>62</b>	<b>8.1</b>			<b>62</b>	<b>2.1</b>	<b>75%</b>
<b>Total</b>		<b>1,322</b>	<b>164.1</b>			<b>1,322</b>	<b>42.7</b>	<b>74%</b>

(1) "NPE" lights would be in Niagara Peninsula Energy Inc. service territory, "HO" lights would be in Hydro One service territory. Inventory is preliminary based on historical records provided by the Town.

## Limitations of One-for-One Replacement Recommendations

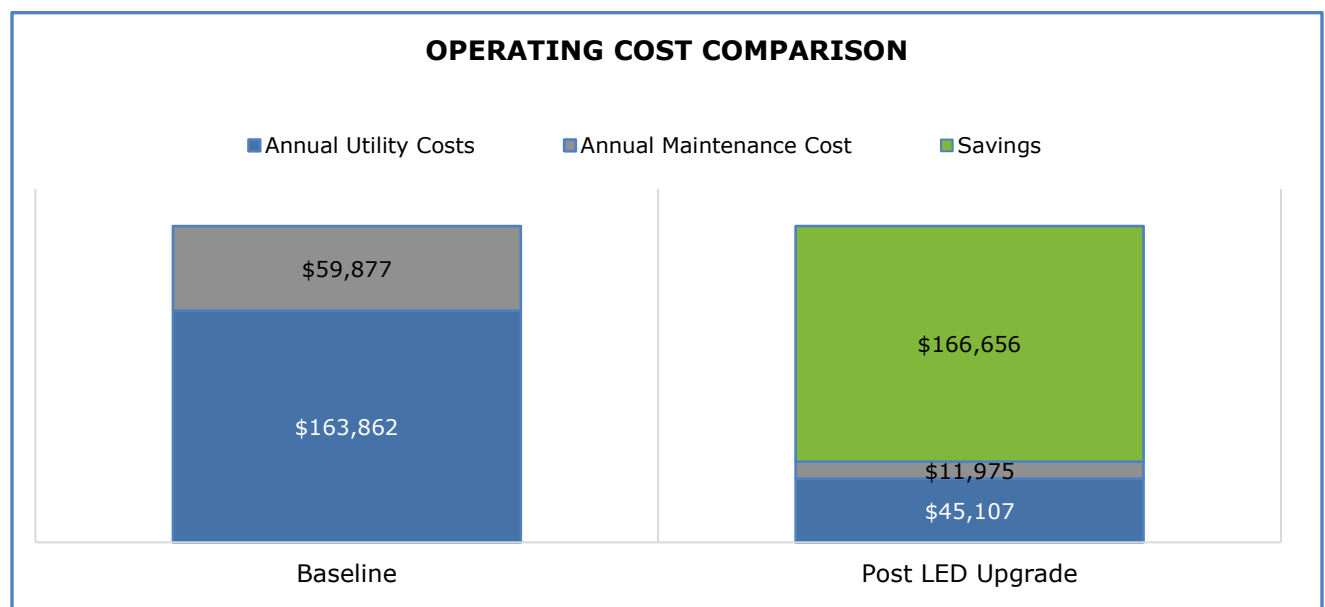
Relying solely on a “one-for-one” replacement technique has its limitations:

- It is limited to existing inventory records that are often outdated and/or inaccurate
- It can only prescribe the LED replacement wattage according to the wattage that is recorded in the most up to date inventory
- No consideration is made for a proper lighting design and updated for current roadway conditions
- Without lighting designs, over-lit or under-lit streets today will continue to be so, even with LEDs

That is why we spend a great deal of effort in our GIS mapping and design stages to ensure that the right lighting levels for each unique street is adequate. Section 3.1 *GIS Inventory Survey* explains these processes and the many benefits in terms of enhanced energy savings, less glare and wasted light, all of which contribute to greater community acceptance.

## 2.2. Expected Savings

CURRENT STATUS	BEFORE UPGRADE	POST UPGRADE	VARIANCE	PERCENT
Number of Fixtures	1,322	1,322	-	-
<b>Annual Electricity Consumption (kWh)</b>	<b>708,326</b>	<b>184,132</b>	<b>524,194</b>	<b>74%</b>
Annual Electricity Costs	\$163,862	\$45,107	\$118,754	72%
Annual Maintenance Cost	\$59,877	\$11,975	\$47,902	80%
<b>Total Street Lights Expenditures</b>	<b>\$223,739</b>	<b>\$57,083</b>	<b>\$166,656</b>	<b>74%</b>
Average Annual Cost per Fixture	\$169	\$43	\$126	74%





## 2.3. Project Financing: Capital Purchase

### Design, Upgrade, and Transfer (DUT)

The Capital Purchase, or Design, Upgrade and Transfer (DUT) option assumes that the project costs are self-financed through reserves, levies, or some other local source. In this option, the Town provides its own financing, and purchases from RealTerm Energy a fully designed and upgraded system, with ownership being transferred immediately upon final payment and commissioning.

Advantages of the DUT Option:

- RealTerm Energy delivers a full turn-key program to manage the entire project, including design, procurement, installation, and final commissioning.
- Easy to administer, no need for third-party involvement unless desired.
- Turnkey services greatly minimize staff time over the life of the project.
- Realization of 100% of the savings from project completion.

## 2.4. Project Costs and Payback Period

PROJECT COSTS	
Number of Fixtures	1,322
<b>Total Project Cost</b>	<b>\$621,810</b>
Price per Fixture	\$470.40

### Investment Return

The payback period of the project, before including any financing costs is **3.6 years**.

### Financing Scenario

The following table shows an example of financing based on an approximate and recently published interest rate of (1.30%, provided August 20<sup>th</sup>, 2021), from Infrastructure Ontario:

CAPITAL COST	TERM (YEARS)	INTEREST RATE	ANNUAL PAYMENT	COST OF BORROWING
\$621,810	5	1.30%	<b>\$128,504</b>	\$20,708

### Annual Savings over 5-year Period for a 5-year loan period with 1.30% interest rate

Year	1	2	3	4	5
Annual Savings	\$166,656	\$171,176	\$175,823	\$180,599	\$185,509
<b>Loan Repayment</b>	<b>\$128,504</b>	<b>\$128,504</b>	<b>\$128,504</b>	<b>\$128,504</b>	<b>\$128,504</b>
Cash Flow	\$38,152	\$42,672	\$47,319	\$52,095	\$57,005
Cumulative Cash Flow	\$38,152	\$80,825	\$128,144	\$180,240	\$237,245

## Project Financing: Energy Performance Contract (EPC)

A growing number of municipalities across North America are achieving performance efficiencies without increasing capital expenses and/or taxpayer burden through EPCs. RealTerm Energy has successfully negotiated, installed and is now operating dozens of EPCs across North America.

### Advantages of an EPC

RealTerm Energy:

- Finances 100% of the up-front capital investment by the Town with an agreement to provide a fixed repayment structure, based on the calculated energy savings.
- Guarantees the LED upgrade will yield a specified reduction in energy over a contracted term.
- Ensures the guaranteed energy savings generated will be sufficient to finance the total project without pursuing capital funding.
- Includes streetlight maintenance costs in the monthly payment for the duration of the EPC.
- Transfers any operating risks from the Town to itself.
- Ensures that at contract completion, the Town retains the full value of the energy and maintenance savings.

With an EPC, the Town can immediately take advantage of energy-efficient LED technology without having to add stress to its ratepayer base or borrow project funds. This frees up municipal resources that can then be assigned to other uses deemed important by the Town. Note that should the Town be interested in an EPC option, RealTerm Energy can prepare a specific stand-alone EPC offering.



## 2.5. Project Schedule

RealTerm Energy is committed to delivering projects on budget and on schedule to the complete satisfaction of its clients. Our extensive experience working on LED streetlight conversion and our clear understanding of what is required ensures the project is successful. The following schedule provides an estimated time frame for a typical LED streetlight conversion of approximately 1,322 lights.

If a notice to proceed is issued by **September 30<sup>th</sup>, 2021**, we are confident that we can complete the project by approximately **June 1<sup>st</sup>, 2022**, with an estimated project schedule as follows:

Stage	Task	Plan Start	Plan End	Action By
Sales				
	Contract signed	End of September 2021		RTE/Town of Pelham
	Kickoff Meeting			RTE/Town of Pelham
GIS				
	Estimated GIS Audit	4-Oct-21	18-Oct-21	RTE
	Estimated GIS QC and Data Processing	19-Oct-21	26-Oct-21	RTE
	Estimated Post Survey Package Sent to the Town	28-Oct-21		RTE
	Estimated Post Survey Questionnaire Received Back from the Town	4-Nov-21		Town of Pelham
Selection of Equipment				
	Estimated Material RFP Launch Date	8-Nov-21		RTE
	Estimated Material RFP Close Date	29-Nov-21		RTE
	Estimated Material RFP Approval/Manufacturer Selection	6-Dec-21		Town of Pelham
Photometric Design				
	Estimated Photometric Designs	9-Dec-21	4-Jan-22	RTE
	Estimated Photometric Design QC	4-Jan-22	7-Jan-22	RTE
IGA				
	Estimated Date IGA Sent to the Town	28-Jan-22		RTE
	Estimated IGA approval	11-Feb-22		Town of Pelham
Procurement				
	Estimated Procurement of fixtures and installation services	18-Feb-22	1-Apr-22	RTE
Installation				
	Estimated Installation of fixtures	25-Mar-22	11-May-22	RTE
	Estimated Installation End Date and Deficiency Clean Up	11-May-22	18-May-22	RTE
Commissioning				
	Estimated Billing Change Submitted to Utility Date	25-May-22	1-Jun-22	RTE
	Estimated Billing Change Approved by Utility Date	1-Jun-22	29-Jun-22	Hydro One & NPE
Project Close-Out				
	Estimated Close-out documents / Commissioning e-Binder	18-May-22	1-Jun-22	RTE

## 2.6. Notes & Calculation Assumptions

1. All cost assumptions were developed utilizing typical supplier pricing and market data available during the preparation of this desktop proposal. We utilize tier one pricing, technical specifications and performance from reputable LED cobrahead manufactures including but not limited to: Acuity Brands, Cree, Eaton Cooper, GE, Leotek, LED Roadway Lighting, Philips, etc. We use the same methodology for decorative and flood/area luminaires when it comes to pricing and manufacturer brand selection. In addition, we take into consideration the aesthetics of the existing luminaires based on either images or specifications provided by the Town of Pelham, or a Google Street View search. All costs are estimates and are subject to changes and adjustments following the completion of the product selection, and the completion of the Investment Grade Audit.
2. The total project cost includes the following costs:
  - Refusing Each new LED fixture to include a new fuse
  - Fuse Holder Replacement 25% of Inventory to require a new fuse holder
  - Rewiring 25% of Inventory to require rewiring
  - Disposal Included
  - Storage & inventory control Included
  - High Voltage Luminaires 20% Cobras estimated to be in high voltage situations
  - Arm Replacement 1% of the davit arms
  - Secondary Connection Refresh 20% of the overhead wires to require correction refresh
  - 50% payment bond and 50% performance bond for an CCDC-14 project valued at over \$500,000.
3. The total project cost does not include any of the following costs:
  - Modification of fixture mounting.
  - Relocation of fixture.
  - The replacement of the fixtures near high voltage situations located in the restricted zone (high voltage luminaires included are outside of the utility restricted zone).
4. Electricity rates reflect the wholesale electricity price. The variations of the wholesale electricity prices are reflected by the Monthly Average Hourly Price and the Global Adjustment. In our calculation for Monthly Average Hourly Price, we used \$0.01846/kWh and for Global Adjustment we used \$0.09750/kWh. These prices reflect the average prices over the last 12 months. The current and the historic Monthly Average Hourly Prices and Global adjustment prices are available on the IESO website<sup>1</sup>.
5. Generic LED luminaires have a 10-year warranty and include a Long-Life Photo control with a 10-year warranty. Generic LED luminaires come with Dimmable Drivers and 7-pin NEMA Photocell Receptacle.
6. Private Lights and Uncaptured Lights: Given the nature of the GIS audit (field survey) and the varying accuracy and completeness of data provided by utility companies and/or the

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<sup>1</sup> Independent Electricity System Operator. Price Overview - Monthly Average Hourly Prices, By Year. Retrieved from <http://www.ieso.ca/Pages/Power-Data/price.aspx>

municipality in anticipation of the GIS audit, there is a possibility that a small quantity of private lights are captured or that certain lights may be uncaptured (“missed”). To minimize these quantities of lights, RTE will work with all data available before the completion of the IGA as well as request the municipality to review and approve the final GIS audit data before proceeding to the IGA phase.

Furthermore, at the IGA stage, labor budgets are established to account for possible fluctuations in scope and spare inventory is recommended to assist with promptly dealing with eventualities that may only be identified during, or after the project’s installation phase. Note that following an approved IGA, RTE will not be responsible for possible changes in field data and/or discrepancies identified in the field.

7. HST is not included in our calculations.

## 2.7. Greenhouse Gas Reduction

ESTIMATED GREEN HOUSE GAS REDUCTION	
Current Annual Energy Consumption (kWh)	708,326
Projected LED Annual Energy Consumption (kWh)	184,132
Annual kWh Savings	524,194
<b>Estimated Annual GHG Reduction (metric tonnes)</b>	<b>16</b>
<b>GHG Reduction over Luminaire Life of 100,000 hours (metric tonnes)</b>	<b>374</b>

\* GHG emissions depend on the electricity supply mix of the jurisdiction and time of use. These have been calculated using the most current, verified emissions factors found in the average emissions for 2019, released by The Atmospheric Fund 2019 Edition of “A Clearer View on Ontario’s Emissions – Electricity Emissions Factors and Guidelines”.



## 2.8. Smart Control Option (Alternative Project Option)

In a world that is rapidly changing, municipalities need to be future-ready, connected and technologically equipped. Adding smart lighting controls can help municipalities make the most of their LED streetlight conversion by saving more energy, reducing maintenance costs and light pollution, and increasing safety on Town streets. You also “future-proof” your streetlight network and open the possibility of adding a myriad of additional Smart City applications later without having to spend the time and money going back to streetlights that have already been installed.

We take a thoughtful, agnostic approach to smart lighting streetlight controls using the average median supplier pricing and market data available during the preparation of this desktop proposal. RealTerm Energy has conducted and/or evaluated numerous RFP’s and tenders for virtually every smart lighting control manufacturer deployed throughout North America, as well as installing approximately 25,000 controls in various cities in Canada and the US. Based upon these results, we can estimate with a high degree of precision what pricing the Town of Pelham would likely see were it to add controls to the project. We utilize tier one pricing, technical specifications and performance from reputable manufacturers.

The table below presents the indicative additional costs associated with the implementation of a smart control system for the Town’s inventory. Note that smart Control Compatibility (due to possible physical fitting limitations) with Post Top fixtures will have to be confirmed based on final control option selected.

PROJECT COSTS	Estimated Total
Number of Luminaires with Smart Controls	1,322
Base LED Upgrade Project Cost	\$621,810
Net Adder for Controls	\$211,199
<b>Project Cost with Smart Controls</b>	<b>\$833,009</b>
<b>Payback Period, Years</b>	<b>4.9</b>

**Note, the above Smart Controls Option includes:**

- Smart Control (“node”) for 1,322 LED luminaires.
- Gateways (if applicable, depending on selected network controls solution).
- Installation.
- System Start-up and Training.
- Central Management System (CMS) for the first year.
  - The ongoing cost of the Software-as-a-service (SaaS) after the first year, which grants access to the CMS, varies by manufacturer but is typically in the range of \$4.00-\$7.00/node/year, based on system network architecture (RF Mesh, Cellular, etc.).

Should the Town wish to proceed with smart controls, RealTerm Energy will assist with providing consultation services to ensuring an appropriate controls solution is selected that meets the Town’s needs today and in the future.

### 3. APPROACH

RealTerm Energy uses a proven six-step turn-key approach to achieve the most efficient LED conversion with the highest degree of energy savings and the greatest assurance of safe light levels. We tailor our work to the context and needs of Pelham, relying on the input of your knowledgeable staff.



1. GIS Inventory	2. Photometric Design	3. Investment Grade Audit Report
<ul style="list-style-type: none"> <li>Conduct comprehensive geospatial streetlight inventory</li> <li>Identify any discrepancies in previous streetlight inventory</li> <li>Develop base for an interactive, geospatial streetlight map</li> </ul>	<ul style="list-style-type: none"> <li>Complete a product evaluation to assist the Town in selecting the desired manufacturer(s).</li> <li>Create photometric designs based on updated streetlight inventory and selected LED luminaires</li> <li>Maximize energy savings and roadway / pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>Complete analysis of your current streetlight infrastructure's performance</li> <li>Comparison of the Town's current energy consumption with the post-conversion LED system</li> </ul>



4. Fixture Procurement	5. Fixture Installation	6. Project Close-Out
<ul style="list-style-type: none"> <li>Complete all administrative and logistical tasks relating to the procurement of the luminaires and control device.</li> </ul>	<ul style="list-style-type: none"> <li>Complete installation of new LED streetlights</li> <li>Real-time installation tracking</li> <li>Recycling / disposal of old fixtures</li> <li>Community outreach</li> </ul>	<ul style="list-style-type: none"> <li>Transfer of commissioning binder</li> <li>Assist with billing changes</li> <li>Transfer of finalized geospatial streetlight map</li> </ul>

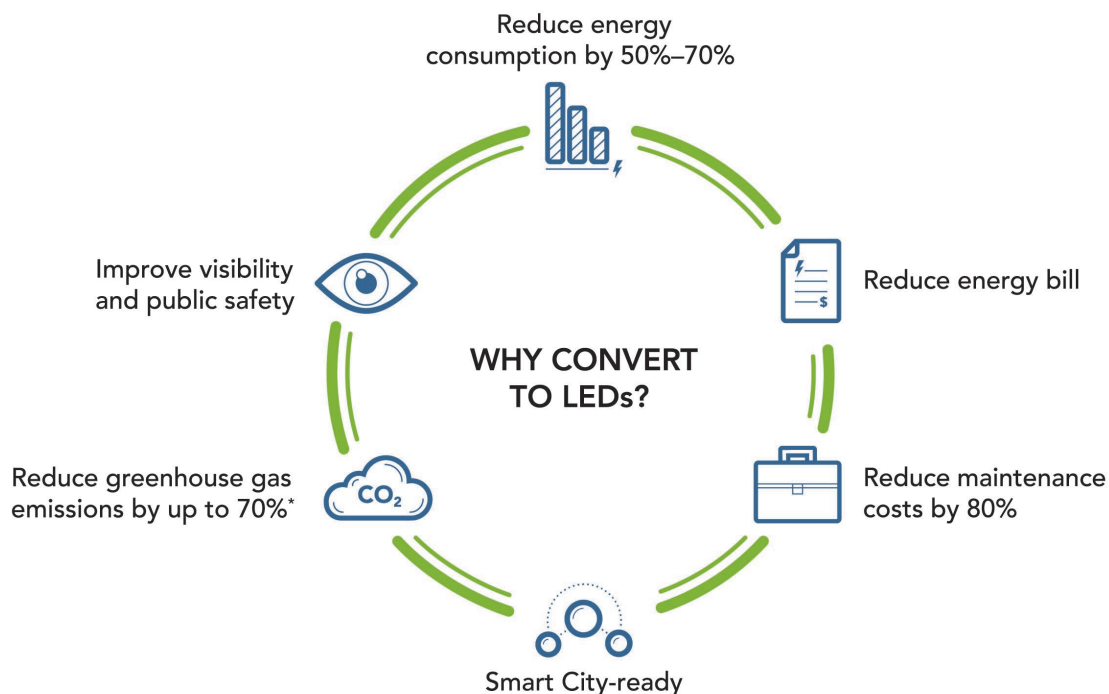
## Project Management Experience

RealTerm Energy's conversion projects have ranged from 15 fixtures to over 40,000 fixtures in urban, suburban and rural municipalities. Our project management team has demonstrated its ability to effectively manage and complete numerous turn-key LED conversion projects simultaneously for multiple municipalities in wide-spread locations. We adapt our approach according to each municipalities' unique needs and streetlight infrastructure requirements.

### Single Point of Contact (SPOC) Management

We will assign a project manager as the single point of contact for the duration of the project. This enhances overall efficiency and increases project transparency. Our team recommends that the Town also assign a SPOC as this will provide a clear management structure to communicate all project information.

## RealTerm Energy Can Help You:



## 3.1. GIS Inventory Survey

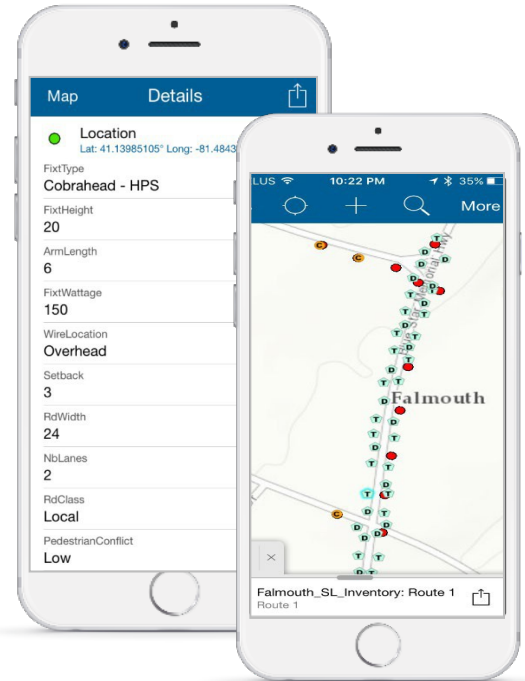
The GIS inventory is a critical component of our approach. Our project team collects all the baseline geospatial streetlight data required to develop a comprehensive photometric design plan of your new LED street lighting network. Your staff will find that asset management is now easy. They will be able to identify each individual light in the system and view its history and characteristics.



RealTerm Energy uses a customized ESRI application to capture and record detailed street light data and measurements.

The GIS-based application records and verifies the following characteristics:

- Exact pole location (longitude, latitude)
- Unique ID number (when present)
- Offset/setback of pole
- Pole material (steel, aluminum, wood)
- Decorative data (pole color, photocell)
- Arm length
- Fixture type, wattage and mounting height
- Connection/wire location (overhead or ground)
- Road width, classification and traffic lanes
- Pedestrian conflict
- Problems (tree trimming, high reach, wiring etc.)



**Our mobile street lighting app offers significant benefits. No specialized equipment or expensive software licenses are required for the Town's authorized users to access the survey data online and all data can be easily exported to MS-Excel.**

Access the link below to view a work product sample of RealTerm Energy's street light map:

[LINK TO SAMPLE INVENTORY MAP](#)



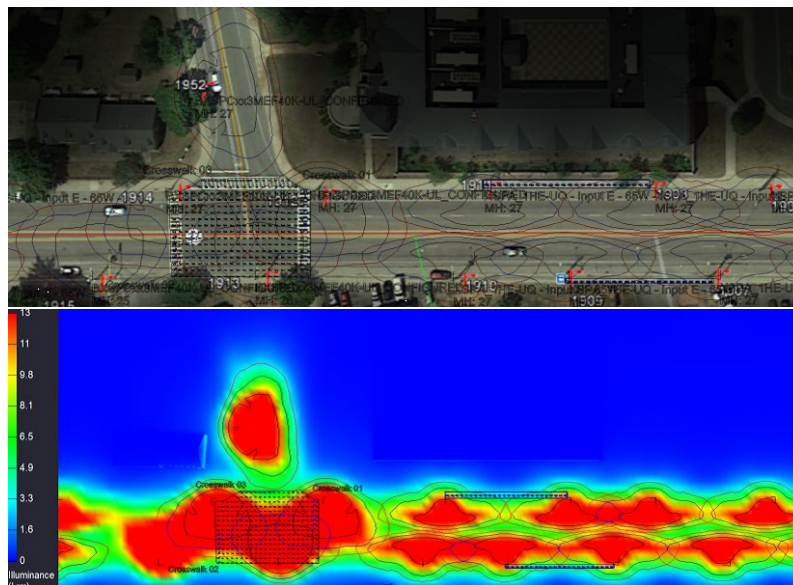
## 3.2. Photometric Design



RealTerm Energy's in-house design team uses GIS-based inventory data to create photometric design plans that optimize lighting quality, safety levels and energy savings.

- All designs follow the RP-8-2018 Roadway Lighting recommendation produced by the IES.
- Each design reduces back-light and up-light while delivering the required light to the targeted area.
- Light trespass and Dark Sky considerations are incorporated to avoid light pollution.

Our team delivers the most efficient design methodology to achieve standardized designs that meet the RP-8-2018 guidelines wherever possible, thereby reducing the number of over- or under-lit roadways. Concerns specific to the Town will be addressed by the design team (such as adding or reducing light levels where desired by the Town). Unique regional characteristics such as neighborhoods, schools, hospitals and areas with higher levels of street crime, accidents and/or vehicle-bicycle-pedestrian conflicts, are included.



"Many municipalities seemed to be going with a one-for-one replacement. We liked the GIS mapping, and the design process brought additional value to the project."

Barry Thompson, Manager of  
Energy Management, City of  
Barrie, ON

Figure 1: The sample graphic above is a digital rendering of RealTerm's photometric calculations, taking into account the GIS inventory survey data and the lighting recommendations for the given street, intersection, sidewalks and pedestrian crosswalks.

### 3.3. Investment Grade Audit Report

RealTerm will produce an Investment Grade Audit (IGA) Report based on this detailed photometric design of your new LED street lighting system. The IGA will provide the Town with 1) a complete analysis of your current streetlight infrastructure's performance and 2) a comparison of the status quo energy consumption with the post-conversion LED system, using highly accurate data from the custom photometric designs.



This bankable report is based on precise, fixture-by-fixture inventory and design, and provides the optimal fixture types, wattages, light distributions and quantities for approval by the Town and for procurement.

### 3.4. Product Procurement

The RealTerm Energy team has directly handled the procurement of approximately 350,000 streetlight fixtures in the last 8 years working with major LED streetlight manufacturers. For the Town, we will act as an informed but impartial advisor through our vendor agnostic approach. Our team will work to first identify the Town's needs and capacity, and then competitively select equipment to address those needs.



Municipalities we've worked with know that we will only design LED streetlight systems using products from reputable manufacturers. These manufacturers must be financially solid, certified, proven and supply the highest quality luminaires accompanied by appropriate warranties. Various fixture characteristics are reviewed during the selection process such as color temperature, color rendition index, distribution pattern, efficacy, etc., and the impacts of each. We also run a lifecycle cost and saving analysis on product offerings.

### 3.5. Installation

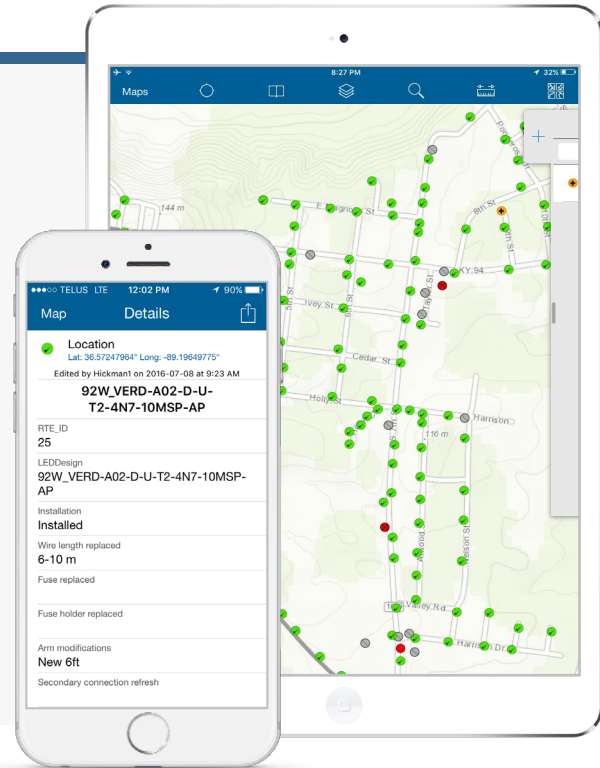
#### Oversight of Installation

Our project manager and field installation supervisor outline installation protocol and provide all necessary training for each team of installers. This ensures that all work is done to the highest standards and is fully documented. Procedures are worked out in advance to ensure a safe working environment and to establish guidelines for handling exceptions and reporting problems.



All installation personnel will use RealTerm Energy's customized GIS streetlight app, which builds on the GIS survey and design data. Use of this app is extremely important as it tells the installation crew what LED luminaire to install at each individual location and confirms what has been installed and removed. Team members and any municipal stakeholders can review project progress in real-time.

The installation team can also use the app to view and/or record any streetlight infrastructure that requires a return trip for unexpected repairs and/or new wiring.



## Installation Protocols

We have established highly efficient installation protocols that are aimed at:

- Minimizing disruption to traffic, pedestrians and residents
- Minimizing the installation timeline
- Maximizing safety standards
- Maximizing installation hours

## We Think Local

Our goal is to identify and contract with qualified local electrical contractors for the conversion of your streetlights. We train them in best practices and the use of the latest technology. This technology allows them to know exactly which streetlight to install in each location and provides detailed documentation to the Town that the correct equipment was installed.

## Media and Community Outreach

Our team has established a strong communication protocol that provides the Town with all information relating to the project and to ensure it is easily understood and quickly made available.

## Quality Control and Spot-Checks

Quality control verifications are initiated as soon as the installation begins, to verify that all standards are being met. We ensure that fixtures are mounted level, that all connections are secure, and that proper safety equipment is in place both for the workers as well as the site. We remain in constant communication with the Town's staff and respond to any issues raised by community members throughout the installation process.

## Billing Changes

The tremendous benefit of your energy savings won't be realized until the energy bills from your utility are adjusted to reflect the new lower kW consumption of the new LED streetlights. Revised billing usually begins the very next billing cycle after installation is completed. Our proven experience with over 40 utilities to date reveals that billing changes have never been refused nor delayed due to our accurate data and efficient procedures.

## Environmental Management Plan (EMP)

RealTerm Energy will develop an Environmental Management Plan (EMP) together with the installation contractors to respect the requirements for the identifying, handling, storing, and shipping of fixtures, and of the hazardous materials resulting from the removal and recycling of the existing luminaires. The Town will be provided recycling certificates for all former fixtures and our team will maintain organized disposal records for reference as needed.

## 3.6. Closeout

RealTerm Energy transfers a Commissioning Binder (electronic) to the Town upon project completion. This ensures that you and your team have all the necessary and complete information going forward. This will include but is not limited to:



Closing and Contractor letters	Disposal approvals
Luminaire and controller warranties	Lighting designs
Cost outline	Customer Care information
All collected metadata on the streetlights and their LED replacements	Final installed mapping (ESRI, KMZ and Excel Spreadsheet Format)
Insurance	Emergency contact details of our key staff
Billing change confirmation from the utility	

## 4. CONCLUSION AND NEXT STEPS

We are available to meet with the municipal staff either in person or by video conference to review this proposal, to answer any questions you may have, and gain a more thorough understanding of your lighting needs and objectives.

The next steps to start the implementation of this new technology and start seeing energy and maintenance savings are as follows:

1. **Recommendation from Staff to Council to Proceed** (RealTerm Energy personnel are available to make a presentation to Council on the contents of this proposal)
2. Letter of Engagement (LOE)
3. RealTerm Energy commences our Investment Grade Audit of your Streetlight network
4. Data Collection (GIS/GPS mapping and physical parameters)
5. Review of Energy and Maintenance Records
6. Photometric Analysis and Detailed Lighting Designs
7. Final Fixture Selection
8. Economic Models and Savings Forecasts
9. Preparation of Project Financing
10. Final Costing and Timetable for Completion
11. Presentation of Findings to Staff/Council
12. Approval by Council (if required)

## 5. COMPANY PROFILE

### 5.1. RealTerm Energy Overview

RealTerm Energy is a North American leader in smart lighting, smart city, and smart building solutions, having completed over 300 successful sches across the U.S. and Canada since 2013. RealTerm Energy's vision is to connect communities and help save the environment through technology.

A U.S. Department of Energy qualified Energy Service Company (ESCO), RealTerm Energy offers turnkey LED lighting upgrades. It is the only company offering a unified suite of smart city solutions for small to mid-sized municipalities and its smart building solution (BrainBox) is the only one of its kind. The company's success is built on a stellar reputation for smooth and timely delivery, a price for performance beyond compare, and a customer-focused mentality offering quality, efficiency, and professionalism every time.

We have to date surveyed, designed and installed over 350,000 streetlights, including over 50,000 smart controls. Our group of over 40 full-time back office and field staff members is dedicated exclusively to designing and executing high-quality and cost-effective LED streetlight conversions for municipalities and utilities.

#### Extensive In-House Expertise



*"The LED streetlight conversion project went very smoothly. RealTerm Energy developed an installation protocol that allowed them to work rapidly, while doing the job right. The RealTerm team converted 10,622 High Pressure Sodium lights to LED in three months (57 working days). We had very few complaints on any aspect of the project, especially considering this change impacted virtually every resident in Barrie."*

*Barry Thompson, Manager of Energy Management, City of Barrie*

#### Realterm Parent Company

Founded in 1991, Realterm is a privately held international on-airport real estate operator and leader in infrastructure and logistics strategies, with installations in North America, Europe, and Asia. Since its inception, Realterm has grown steadily, currently managing over \$7+ billion in assets.

RealTerm Energy, established in 2013, is the division of Realterm that was created to deliver best-in-class technological, managerial, and financial solutions for efficient energy-related projects to municipalities and public authorities.

### World Bank Recognition

In addition, we are particularly proud to have stood out, on a global scale from similar service providers, as noted by the World Bank Group in 2016. RealTerm Energy's "remarkable" partnership in the joint-procurement model developed with LAS and the Association of Municipalities of Ontario has been recognized by the World Bank as being among the most efficient and successful delivery models in the world. The World Bank Group estimates that 20% of global electricity is consumed by lighting and it projects that widespread adoption of LED lighting can reduce that to 7%.



**WORLD BANK GROUP**

**Proud to be recognized by the World Bank.**

RealTerm Energy was honored to be chosen by the World Bank to help advance its global initiative of reducing electricity consumption. Post extensive research of various programs and their providers around the globe, the World Bank selected RealTerm Energy due to it being a leader in this field and its highly successful track record.

On the world stage, RTE was invited to speak, on two separate occasions, to World Bank delegates on best practices for a successful LED municipal streetlight conversion. The first, in Washington, D.C., related to Process, Management and Control, and the second, held in Lima, Peru, was related to project finance. RealTerm Energy continues to be called upon as an industry forerunner and provides consulting services for various countries around the globe.

Access our homepage to view the complete case study: <http://www.realtermenergy.com/>



## DISCLAIMER

This Proposal is confidential and is being provided to the Town of Pelham for the sole purpose of demonstrating project scenarios for the Town to consider regarding the design and upgrade of its street lighting network to LED technology. The Proposal, including evaluating any possible shared energy savings partnership, is not to be used for any other purpose or made available to any other party without the prior written consent of RealTerm Energy.

This Proposal contains select information about the Project and the LED Street Lighting market but does not contain all the necessary information to evaluate the exact cost and energy savings potential of the Project. The financial projections contained herein are for general reference only and are based on assumptions relating to overall market dynamics, historical data and project-specific preliminary information pertaining, but not limited to: ownership, inventory breakdown and operating costs. Accordingly, actual results may vary from our preliminary projections and can only be confirmed following a GPS mapping and data collection of all streetlight assets and further analysis during the development of an Investment Grade Audit (IGA) Report. In addition, any changes to the scope of work established within the preliminary analysis will impact the cost and savings projections.

While the information contained in this Proposal and any other Evaluation Material is believed to be reliable, RealTerm Energy cannot guarantee its accuracy or completeness. Prospective clients or other parties authorized by the prospective client are to use such material solely to facilitate the prospective client's investigation and are advised to make their own independent investigations, projections and conclusions regarding the financials and savings potential of the Project without reliance on this Proposal or any other Evaluation Material. Although additional Evaluation Material, which may include engineering, system design or other reports, may be provided to qualified parties as the evaluation period proceeds, prospective clients should seek advice from their own attorneys, accountants, engineers and street lighting experts as deemed appropriate.

RealTerm Energy expressly reserves the right, at its sole discretion, to reject any offer to partner or to terminate any negotiations with any party at any time upon written notice to the client. RealTerm Energy shall have no legal commitments or obligations to any prospective client unless and until a written term sheet has been fully executed, delivered and approved by RealTerm Energy.

This Proposal is the property of RealTerm Energy and may be used only by parties approved by RealTerm Energy.

## APPENDIX A: VALUE-ADDED SERVICES

## Smart City Solutions – My Town

### RealTerm Energy's Smart City Solution: MyTown

*City Hall in the Palm of Your Hand*

Currently, there are numerous visions of a "Smart City". However, most Smart City solutions today are expensive, technology-first, IOT device-oriented, and are typically offered by large conglomerates looking to sell technology. While technology does form a part of RealTerm Energy's Smart City solution, our vision is much broader than that and is comprised of three main components:

- 1) **Citizen-Centricity:** A free, user-friendly app that makes it simple to report a problem like a pothole, a streetlight outage, or a parking concern and one can use the handheld device's built-in GPS and camera to help pinpoint the problem area for follow-up by staff. Access and transparency enable citizens, staff, and elected officials to be informed and responsive, leading to better government.
- 2) **Smart Maps:** A secure, real-time geo-visualization platform that allows citizens and cities to connect, interact and view all IOT devices on one platform. Smart Maps tracks and displays information on buses, garbage collection, snow removal equipment, air quality sensors, video surveillance, and smart municipal streetlighting, amongst other features.
- 3) **Valuable User Network:** A secure municipal network where pre-screened and qualified participants (e.g., City Managers, City CFOs, Mayors, Elected Officials, etc.) can interact freely in a protected environment. Sharing their collective knowledge and information for the benefit of all stakeholders. **MyTown** allows for the free sharing of data, ideas, information, and best practices. As the network grows, and more municipalities, services, and partners are added, a virtuous cycle emerges, and significant value to the user-base is created.



MyTown, currently used by over 30 municipalities, is a user-friendly app that displays public notices and events, election information, contact numbers for municipal departments, a customizable garbage and recycling calendar and links to the municipalities' social media platforms.

Our software makes it simple to report a problem like a pothole, a streetlight outage, or a parking concern and one can use the handheld device's built-in GPS and camera to help pinpoint the problem area for follow-up by staff. This feature also triages incoming information, automatically directing it to the appropriate tier of government for action thus minimizing overlapping or misdirected notifications.

Access and transparency enable citizens, staff, and elected officials to be informed and responsive, leading to better government. MyTown offers citizens the information they need and allows them to provide input on issues of concern.

New features and functionality are continually being developed and added to MyTown in response to ongoing municipal feedback.

## MyTown Starter Package:



## Popular Tile Add-Ons:



# The Future of Building Automation | BrainBox AI

A Smart City harnesses the power of its data to run more efficiently. At RealTerm Energy we take it one step further. In partnership with our sister company, **BrainBox AI**, we offer our clients an opportunity to optimize existing HVAC control systems in their municipal buildings, schools, universities, and hospitals, by using Artificial Intelligence (AI) technology.

## Introducing AI to HVAC: The Future of Building Automation

BrainBox AI's award-winning technology converts existing HVAC installations into autonomous HVAC systems using AI and cloud computing. A self-adapted artificial intelligence technology to proactively optimize the energy consumption of one of the largest climate change contributors: **Buildings**.

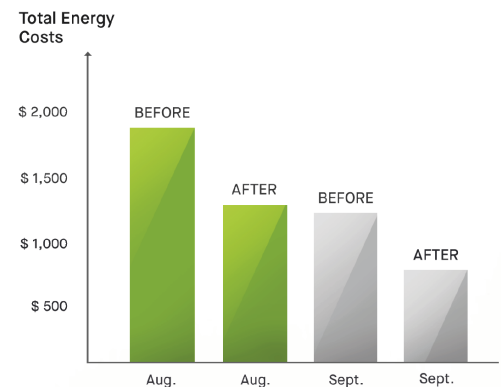
BrainBox AI can analyze information from a multitude of internal and external data points, combining time series data with deep learning engines and delivering high quality predictions for each zone of the building. Its advanced technology enables it to make exceptionally accurate predictions about the built environment, empowering the deployment of over 25 algorithms to drive the HVAC system. The result is a 24/7 self-operating building that is functioning at optimal efficiency and ensuring maximum comfort.



BrainBox AI's technology converts existing HVAC installations into autonomous HVAC systems using AI and cloud computing. The solution is designed to predict a building's thermal load and enable the HVAC system to operate autonomously, in real-time, leading to the following benefits:

## BrainBox AI's Unique Advantage

- **Easy installation** in less than half a day
- Reduced total energy costs up to **25 %**
- Savings generated in less than 3 months
- Improved **occupant comfort** by up to **60%**
- Decrease in building's carbon footprint by **20-40%**
- Extended useful life of the building's HVAC system
- Reduced **maintenance costs** of your building's existing HVAC equipment.
- Uses existing BAS and requires **no additional sensors**, resulting in no upfront capital expense.

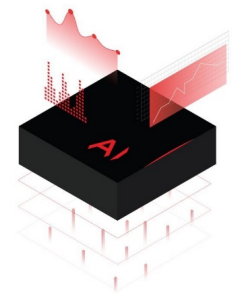


## Utilizing the Power of Artificial Intelligence

Our AI engine, together with our proprietary process, allows you to move from reactive to pre-emptive operations management in four steps.

**Step 1: Installation:** The BrainBox AI engine is installed in the building in less than half a day.

**Step 2: Getting Acquainted:** For a period of 4-6 weeks the AI engine learns your building's specific operating behavior by gathering data sets every 5 minutes. BrainBox AI then creates a building energy profile (different for each zone of the building) for making informed predictions about future energy flow.



**Step 3: Optimizing Flow:** Using over 25 customized algorithms working in real time, our AI engine instructs your existing HVAC system on how to operate more intelligently and efficiently. BrainBox AI enables energy savings within 3 months.

**Step 4: Continuous Improvement**

Our solution continually amalgamates and analyzes all generated data to further optimize operational efficiency and discover other unique insights. Beyond energy savings, BrainBox will be able to provide additional actionable insights in the future.

## EV Charging Stations

Public electrical vehicle charging stations will continue to gain importance with the increased adoption of electrical vehicles. RealTerm Energy is currently working on implementing and reviewing the possibility of installing stations for several of our clients in the US and Canada. As part of a value-added service, our services may include general consultation, review of EV charging options and locations, and/or full turnkey implementations, running costs and revenue projections from the implementation of public EV stations.



*RealTerm Energy is currently in the process of installing pole mounted EVSE chargers, such as the model depicted above, for one of our clients.*