2018

Town of Lysander

Preliminary Analysis for Energy Performance Contract

August 21, 2018

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Table of Contents

Section	Page
Executive Summary	1
Historical Energy Usage	3
Improvement Measure Overview	4
Proposed Project Financial Proformas	8
Street Lighting Case Study	10

Executive Summary

Danforth has surveyed and investigated the energy use and operational expenses for the facilities and streetlights in the Town of Lysander. Our proposed solution will upgrade and modernize the streetlights, while reducing energy utilization and improve the overall operational efficiency of the Town.
The program we have developed is to deliver a performance-based, turnkey, self-funding project. The benefit to the town is to provide necessary infrastructure upgrades that are paid for through a guaranteed savings program. All program costs are offset by savings and potentially generate additional cash flow beyond the cost of the program. These additional funds can be used at the discretion of the Town of Lysander to fund other initiatives or programs that have yet to be implemented.

Danforth has completed a preliminary assessment that would replace the antiquated streetlights with modern LED street lights and significantly reduce maintenance costs. This street lighting project would have a total implementation price of **$1,868,747**, which would include the cost of purchasing the existing equipment from the utility company as well as the costs of purchasing and installing the new LED fixtures. The program is completely funded from the annual guaranteed energy savings of **$36,933** combined with the annual maintenance savings of **$245,928**, equating to an overall simple payback of **6.6 years**.

A summary of the street lighting improvement project is shown below:

15 Year Term Project Highlights	
Project Implementation Cost	$1,868,747
Energy Savings Per Year	$36,933
Maintenance Savings Per Year	$245,928
Simple Payback	6.6 years

Danforth has worked with utility companies, our vendors, and municipal offices to bring street lighting improvements from concept to reality - one that yields significant energy savings throughout the life of these projects. The Town's street lights currently consist primarily of high-pressure sodium cobra heads, flood lights, and post top lamps, which require costly maintenance and emit a yellow tinted light, making it harder to distinguish colors. Modern street lights use LED's to illuminate the streets while using approximately 1/3 of the energy consumed by the existing fixtures. LED lights also last much longer (50,000 to 100,000 hours or more) than high-pressure sodium lights, drastically reducing the required maintenance.

An energy performance contract is a financial vehicle utilizing New York State Energy Law Article 9 that allows the Town of Lysander to use future utility, operations and maintenance savings to pay for the cost of energy efficiency retrofits and upgrades today. Our suggested methodology for implementing these improvements is beneficial to the Town in a number of ways:

- Eliminates the financial risk of the cost exceeding the original quoted price since the contract will be a "Guaranteed Maximum Price" (GMP) format.

- Reduces the engineering and procurement cost of the project due to the design/build nature which reduces costly overlaps and non-productive efforts.

- Access to capital via third party resources to fund the project. This allows Lysander to use its existing in-house capital resources for other desired improvements or projects.

Danforth will guarantee the results of the savings projections as well as the technical implementation, eliminating the risk to Lysander.

Historical Energy Usage

Establishing the baseline annual energy usage is a fundamental step in identifying the level of energy savings opportunities which exist in the Town.

The Town of Lysander provided Danforth with a list of municipal properties as well as a list of the associated utility accounts that the Lysander is responsible for. Danforth was then able to request 12 months of historical data from National Grid for the Street Lighting accounts. The annual utility summary table is provided below:

TOWN OF LYSANDER ANNUAL UTILITY SUMMARY TABLE - STREET LIGHTING

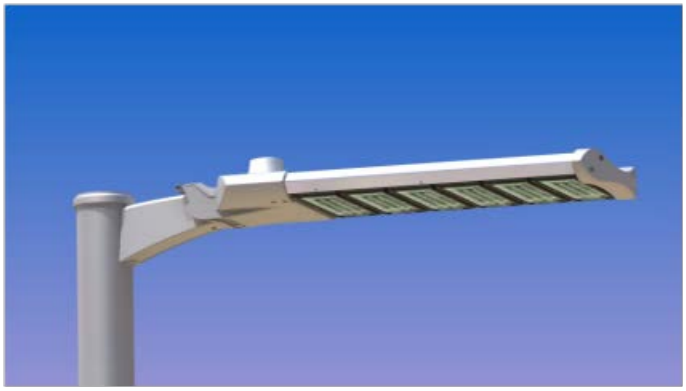
	Total Fixture Quantity	Electric					Total Costs
		Annual Usage	Energy Costs	Maintenance Costs	Consumption Rate	Blended Rate	
Street Lighting (17 total accounts)	592	358,678	$ 54,071	$ 245,928	$ 0.151	$ 0.836	$ 299,999
TOTAL	**592**	**358,678**	**$ 54,071**	**$ 245,928**	**$ 0.151**	**$ 0.836**	**$ 299,999**

The electricity costs shown above include transportation charges from National Grid as well as supply charges from Constellation, for which the Town is billed separately.

The above street lighting accounts are on National Grid's SC-2 rate tariff. National Grid owns all of the equipment associated with these accounts and charges the Town monthly fees to maintain it. The inventory of fixtures and lamps are listed directly on the monthly bills for each account.

Improvement Measure Overview

Concept



Street lighting costs are comprised of both electricity usage as well as monthly maintenance fees from the utility company. Newly approved state legislation has opened the opportunity for government entities to purchase the street lighting equipment from the utility companies, offering them the ability to retrofit the street lights with energy efficiency LED lighting. This also relieves the Town of the costly monthly maintenance fees and control of these line items in your operating budget.

An example of a street lighting conversion before (left) and after (right)

Existing Conditions

The Town of Lysander has seventeen street lighting accounts with National Grid with a total of 592 street light fixtures. The majority of the street lights in Lysander are cobrahead-style roadway fixtures; however there are also a number of post top and decorative light fixtures throughout the Town.

The majority of these street lights and related equipment are currently owned by National Grid and the Town pays the utility company over $20,000 per month to maintain this equipment in addition to their electricity usage costs.

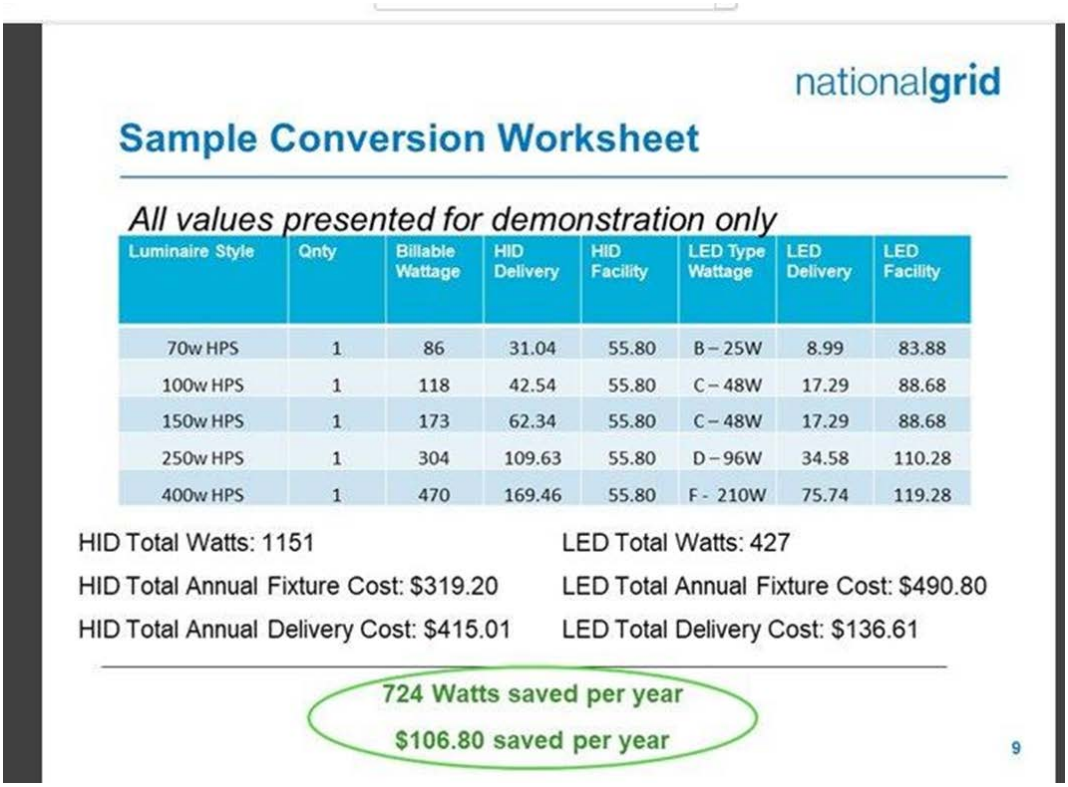
Benefits

LED street light fixtures provide better, clearer, and more consistent light quality that will make the City of Cortland's streets safer through:

- Fewer streetlight outages as LED's have a much longer life expectancy reducing replacement cost significantly.
- A truer white light quality, which leads to better color rending, allowing colors to seem more natural.
- Minimization of light trespass onto homes and businesses by the "aiming" of LED fixtures.
- Reduced crime and enhanced public safety.
- More consistent distribution of light resulting in fewer dark spots. Traditional light sources typically provide too much light in the area directly under the pole. This ensures that the outer areas surrounding the pole are well lit. Light from each LED can be guided with secondary optics to spread the light more evenly and ensure clearer, consistent lighting at all distances from the pole.
- Up to 70% decrease in energy use and carbon emissions using LED lamps.

Economic Comparison of National Grid's Options

The "Facility Charges" from National Grid are rental and maintenance fees charged to the customer for the street lights. These fees are to cover repairs, maintenance, inspections, and 811 "call before you dig" wire tracing and marking. The slide below (from National Grid) summarizes their Conversion to LED option.



nationalgrid

Sample Conversion Worksheet

All values presented for demonstration only

Luminaire Style	Qnty	Billable Wattage	HID Delivery	HID Facility	LED Type Wattage	LED Delivery	LED Facility
70w HPS	1	86	31.04	55.80	B – 25W	8.99	83.88
100w HPS	1	118	42.54	55.80	C – 48W	17.29	88.68
150w HPS	1	173	62.34	55.80	C – 48W	17.29	88.68
250w HPS	1	304	109.63	55.80	D – 96W	34.58	110.28
400w HPS	1	470	169.46	55.80	F - 210W	75.74	119.28

HID Total Watts: 1151

HID Total Annual Fixture Cost: $319.20

HID Total Annual Delivery Cost: $415.01

LED Total Watts: 427

LED Total Annual Fixture Cost: $490.80

LED Total Delivery Cost: $136.61

724 Watts saved per year

$106.80 saved per year

9

When upgrading to new LED fixtures with 100,000 hour life, you would think these "Facility" fees should decrease with less maintenance needed. But, according to National Grid, these "Facility" fees actually increase. The increase ranges from 50% to 100% or more based on the LED wattage. The increase drowns out the LED energy savings to reflect a negative payback. A basic project comparison is shown below. The payback calculation for NGRID's Conversion uses only the increase of Facility Charges ($49,119).

	Choosing Danforth and Purchasing Lighting Equipment	Having National Grid perform the LED Conversion
Fixture Quantity:	592	193
Annual "Facility" Costs (Before):	$245,928	$80,176
Project Cost:	$1,937,012	$40,134
Energy Savings:	$36,896	$10,696
Annual "Facility" Costs (After):	$0	$129,295
Simple Payback:	6.85	-1.04

Next Steps

- Town of Lysander issues RFP to solicit qualified Energy Performance Contractors.
- Detailed Energy Audit (DEA): The DEA will provide a comprehensive survey of all the street lights to fine-tune our projections for energy savings and installed costs for street lighting measures. The price shown in this analysis for the street lighting measure includes an actual cost, provided by National Grid, to purchase the Town's equipment from National Grid.

This program belongs to the Town of Lysander and our team operates with that in mind. Creativity and open communication is vital to the successful development and implementation of a Danforth performance contract, and our customers are involved in every decision.

Danforth has been providing facility improvement solutions throughout New York State for many years and welcomes the opportunity to help the Town of Lysander achieve their goals through this exciting endeavor.

TOWN OF LYSANDER PERFORMANCE CONTRACT
PROFORMA 10 YEAR CASHFLOW
15 YEAR LIFE CYCLE PROJECTION

Year	Energy Costs	Assets				Liabilities					Net Annual Benefit	Cumulative Cash Flow
	Base Year Energy Costs	Energy Savings	Associated Savings (1)	Estimated Rebates & Incentives (2, 3)	Total Assets	Payment (4)	Performance Assurance	Service Contract	On-Going Services (5, 6)	Total Liabilities		
1	$54,071	$36,933	$245,928	$13,118	**$295,979**	($226,881)	($2,000)	($60,000)	($62,000)	**($288,881)**	$7,098	***$7,098***
2	$55,693	$38,041	$253,306	$7,136	**$298,483**	($226,881)	$0	($61,200)	($61,200)	**($288,081)**	$10,402	***$17,501***
3	$57,364	$39,183	$260,905	$0	**$300,088**	($226,881)	$0	($62,424)	($62,424)	**($289,305)**	$10,783	***$28,283***
4	$59,085	$40,358	$268,732	$0	**$309,090**	($226,881)	$0	($63,672)	($63,672)	**($290,553)**	$18,537	***$46,820***
5	$60,858	$41,569	$276,794	$0	**$318,363**	($226,881)	$0	($64,946)	($64,946)	**($291,827)**	$26,536	***$73,357***
6	$62,683	$42,816	$285,098	$0	**$327,914**	($226,881)	$0	($66,245)	($66,245)	**($293,126)**	$34,788	***$108,145***
7	$64,564	$44,100	$293,651	$0	**$337,751**	($226,881)	$0	($67,570)	($67,570)	**($294,451)**	$43,301	***$151,445***
8	$66,501	$45,423	$302,460	$0	**$347,884**	($226,881)	$0	($68,921)	($68,921)	**($295,802)**	$52,082	***$203,527***
9	$68,496	$46,786	$311,534	$0	**$358,320**	($226,881)	$0	($70,300)	($70,300)	**($297,180)**	$61,140	***$264,667***
10	$70,551	$48,190	$320,880	$0	**$369,070**	($226,881)	$0	($71,706)	($71,706)	**($298,586)**	$70,484	***$335,151***
11	$72,667	$49,635	$330,507	$0	**$380,142**	$0	$0	($73,140)	($73,140)	**($73,140)**	$307,002	***$642,153***
12	$74,847	$51,124	$340,422	$0	**$391,546**	$0	$0	($74,602)	($74,602)	**($74,602)**	$316,944	***$959,097***
13	$77,093	$52,658	$350,635	$0	**$403,293**	$0	$0	($76,095)	($76,095)	**($76,095)**	$327,198	***$1,286,295***
14	$79,406	$54,238	$361,154	$0	**$415,391**	$0	$0	($77,616)	($77,616)	**($77,616)**	$337,775	***$1,624,070***
15	$81,788	$55,865	$371,988	$0	**$427,853**	$0	$0	($79,169)	($79,169)	**($79,169)**	$348,685	***$1,972,755***
Total		***$686,921***	***$4,573,994***	***$20,254***	***$5,281,168***	***($2,268,809)***	***($2,000)***	***($1,037,605)***	***($1,039,605)***	***($3,308,414)***	***$1,972,755***	***$1,972,755***

ASSUMPTIONS

Total Implementation Cost:	**($1,868,747)**	**Total Estimated Utility Incentives:**	**$17,840**	**Cumulative Savings:**	**$1,972,755**
Other Costs(Construction Interest):	**($61,647)**	**Construction Period Escrow Interest (9):**	**$2,414**	**Net Present Value:**	**$1,345,484**
Net Financed Investment:	**($1,930,395)**			**Percent of Utility Savings**	**68.3%**
Interest Rate (7):	**3.25%**			**Guarantee Period(yrs):**	**1**
Financial Term in Years:	**10**	**Service Inflation Rate:**	**2%**		
Annual Payment:	**($226,881)**	**Energy Inflation Rate:**	**3%**		
Simple Payback (years) (8):	**6.6**	**Operational Savings Inflation Rate:**	**3%**		

Notes:

1. *Associated Savings is defined as operational and maintenanc*
2. *Total utility rebate incentives applied over years 1, 2.*
3. *Non-guaranteed estimated Rebates & Incentives include Utility incentives and Construction Period Escrow Interest*
4. *Payment represents an annual sum of periodic payments.*
5. *On Going Services are escalated at Service Inflation Rate.*
6. *Performance Assurance required during guarantee period only.*
7. *Interest Rate Subject to market adjustment prior to close.*
8. *Simple Payback = (Total Project Cost) / (First Year Energy Savings plus Associated Savings)*
9. *Construction interest based on 12 month funding to payment schedule.*
10. *Annual guarantee may not exceed Total Project Cost.*
11. *Annual guarantee amount is based on revenue neutral program.*

TOWN OF LYSANDER PERFORMANCE CONTRACT
PROFORMA 15 YEAR CASHFLOW
15 YEAR LIFE CYCLE PROJECTION

Year	Energy Costs	Assets				Liabilities					Net Annual Benefit	Cumulative Cash Flow
	Base Year Energy Costs	Energy Savings	Associated Savings (1)	Estimated Rebates & Incentives (2, 3)	Total Assets	Payment (4)	Performance Assurance	Service Contract	On-Going Services (5, 6)	Total Liabilities		
1	$54,071	$36,933	$245,928	$13,118	**$295,979**	($166,381)	($2,000)	($60,000)	($62,000)	**($228,381)**	$67,598	***$67,598***
2	$55,693	$38,041	$253,306	$7,136	**$298,483**	($166,381)	$0	($61,200)	($61,200)	**($227,581)**	$70,902	***$138,500***
3	$57,364	$39,183	$260,905	$0	**$300,088**	($166,381)	$0	($62,424)	($62,424)	**($228,805)**	$71,283	***$209,783***
4	$59,085	$40,358	$268,732	$0	**$309,090**	($166,381)	$0	($63,672)	($63,672)	**($230,054)**	$79,037	***$288,819***
5	$60,858	$41,569	$276,794	$0	**$318,363**	($166,381)	$0	($64,946)	($64,946)	**($231,327)**	$87,036	***$375,855***
6	$62,683	$42,816	$285,098	$0	**$327,914**	($166,381)	$0	($66,245)	($66,245)	**($232,626)**	$95,288	***$471,143***
7	$64,564	$44,100	$293,651	$0	**$337,751**	($166,381)	$0	($67,570)	($67,570)	**($233,951)**	$103,800	***$574,944***
8	$66,501	$45,423	$302,460	$0	**$347,884**	($166,381)	$0	($68,921)	($68,921)	**($235,302)**	$112,582	***$687,525***
9	$68,496	$46,786	$311,534	$0	**$358,320**	($166,381)	$0	($70,300)	($70,300)	**($236,681)**	$121,640	***$809,165***
10	$70,551	$48,190	$320,880	$0	**$369,070**	($166,381)	$0	($71,706)	($71,706)	**($238,087)**	$130,983	***$940,148***
11	$72,667	$49,635	$330,507	$0	**$380,142**	($166,381)	$0	($73,140)	($73,140)	**($239,521)**	$140,621	***$1,080,770***
12	$74,847	$51,124	$340,422	$0	**$391,546**	($166,381)	$0	($74,602)	($74,602)	**($240,984)**	$150,563	***$1,231,332***
13	$77,093	$52,658	$350,635	$0	**$403,293**	($166,381)	$0	($76,095)	($76,095)	**($242,476)**	$160,817	***$1,392,149***
14	$79,406	$54,238	$361,154	$0	**$415,391**	($166,381)	$0	($77,616)	($77,616)	**($243,998)**	$171,394	***$1,563,543***
15	$81,788	$55,865	$371,988	$0	**$427,853**	($166,381)	$0	($79,169)	($79,169)	**($245,550)**	$182,303	***$1,745,847***
Total		***$686,921***	***$4,573,994***	***$20,254***	***$5,281,168***	***($2,495,717)***	***($2,000)***	***($1,037,605)***	***($1,039,605)***	***($3,535,322)***	***$1,745,847***	***$1,745,847***

ASSUMPTIONS

Total Implementation Cost:	**($1,868,747)**	**Total Estimated Utility Incentives:**	**$17,840**	**Cumulative Savings:**	**$1,745,847**
Other Costs(Construction Interest):	**($66,466)**	**Construction Period Escrow Interest (9):**	**$2,414**	**Net Present Value:**	**$1,278,141**
Net Financed Investment:	**($1,935,213)**			**Percent of Utility Savings**	**68.3%**
Interest Rate (7):	**3.50%**			**Guarantee Period(yrs):**	**1**
Financial Term in Years:	**15**	**Service Inflation Rate:**	**2%**		
Annual Payment:	**($166,381)**	**Energy Inflation Rate:**	**3%**		
Simple Payback (years) (8):	**6.6**	**Operational Savings Inflation Rate:**	**3%**		

Notes:

1. *Associated Savings is defined as operational and maintenanc*
2. *Total utility rebate incentives applied over years 1, 2.*
3. *Non-guaranteed estimated Rebates & Incentives include Utility incentives and Construction Period Escrow Interest*
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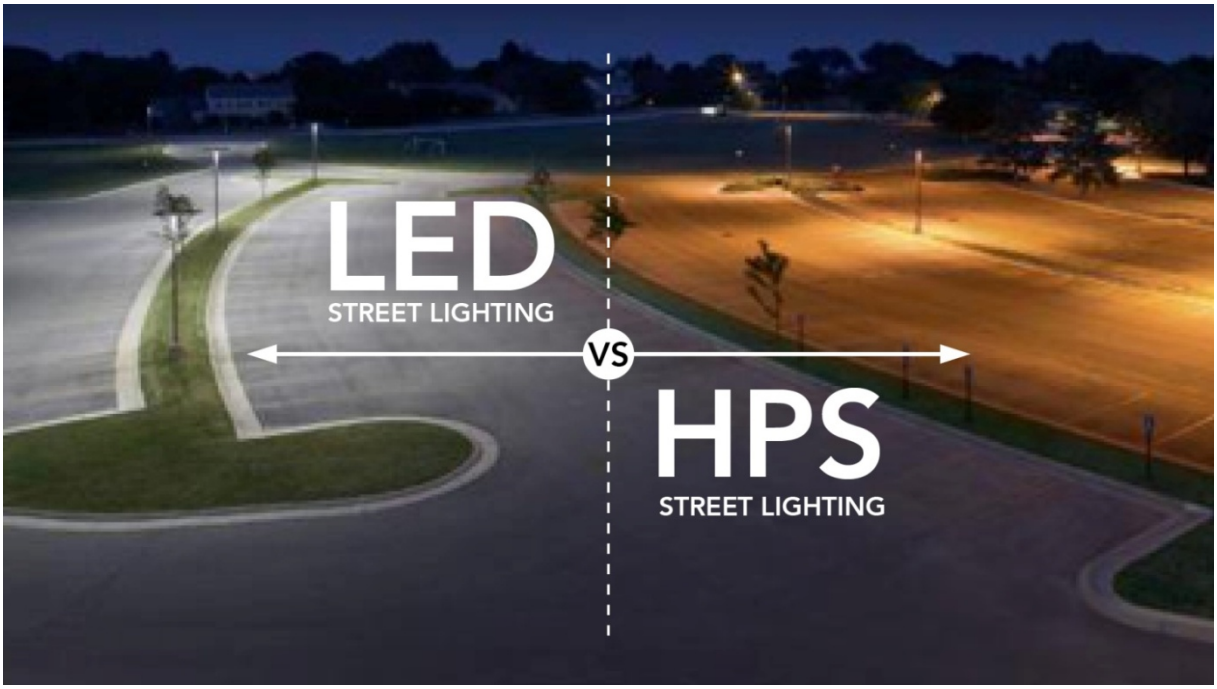
11. *Annual guarantee amount is based on revenue neutral program.*

Town of West Seneca – Street Lighting Case Study



Project
Energy Performance Contract Phase II

Owner
Town of West Seneca

Contract Value
Original - $3,900,000
Actual - $3,900,000

Project Contact
Sheila Meegan
(716) 674-5600

Danforth's Role
Energy Performance Contractor

Energy Savings
1,400,000 kWh
Annual Savings

The Town of West Seneca was faced with aging street lighting infrastructure throughout the town. After a successful Phase I consisting of building envelope, mechanical and control upgrades, the Town selected Danforth to continue providing energy reduction work through a Phase II project.

Danforth worked with the Town to identify light poles which were to be changed out. During this exploration phase, Danforth discovered that the Town's lights were owned by NYSEG and National Grid. Danforth worked with the Town to purchase these lights from the utilities in order to do the lighting retrofit. Danforth will be replacing the majority of outdated high-pressure sodium lights with new high efficiency LED cobra heads and post tops. The new LED lighting provides the Town and its residents whiter, brighter light making it safer for pedestrians as well as drivers.

This solution provides the Town with annual savings of 1,400,000 kWh which equates to approximately $113,000 in utility cost avoidance. Additionally, the new lights have lead to an annual maintenance savings of $347,000.